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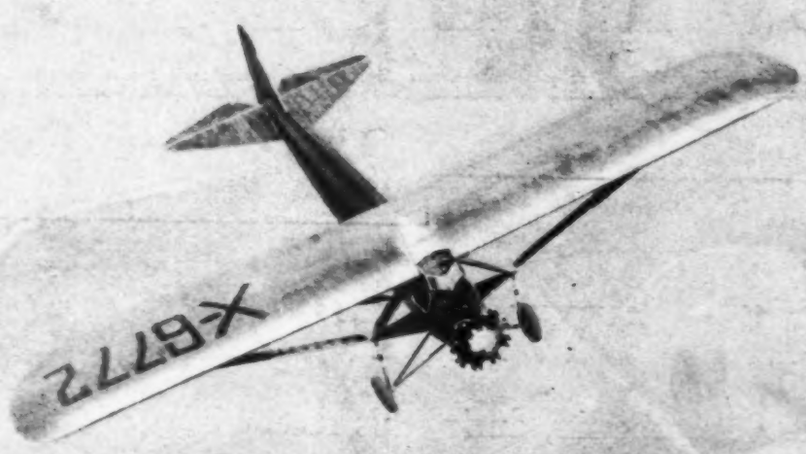

The new eight passenger cabin monoplane American Albatross "B-1" in flight

VOLUME XXV

NUMBER 24

Special Features

American Albatross B-1

Akron Municipal Airport

Testing Equipment for Aircraft Engines

AVIATION PUBLISHING CORPORATION
250 WEST 57TH STREET, NEW YORK

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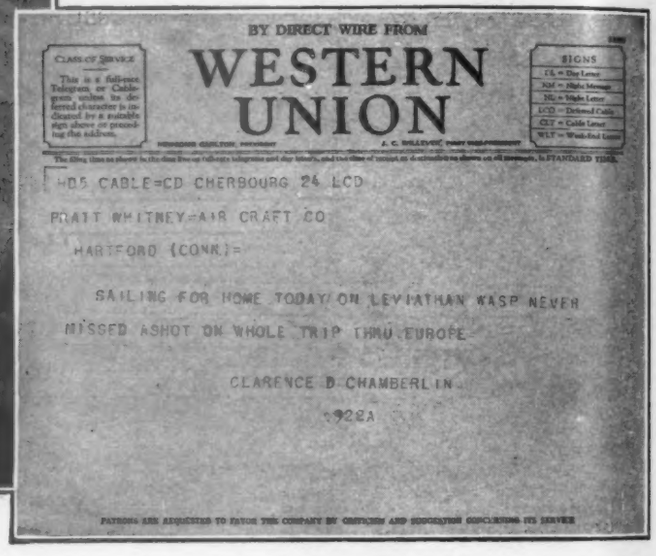
Clarence Chamberlin (left)
with his Wasp powered
Loening Amphibian



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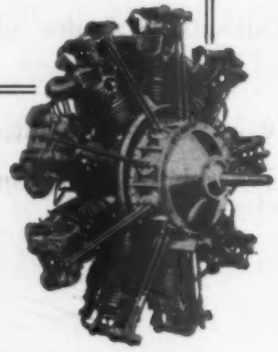
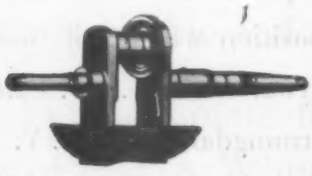
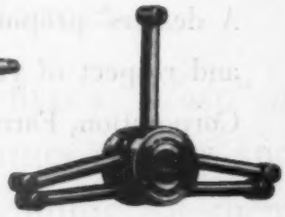


Nine-cylinder Siemens Radial Air-Cooled Airplane Engine Type SN-11, distributed by K. G. FRANK of New York, N. Y.





Nickel Steel crankshaft and (right) connecting rod assembly of Siemens Airplane Engine

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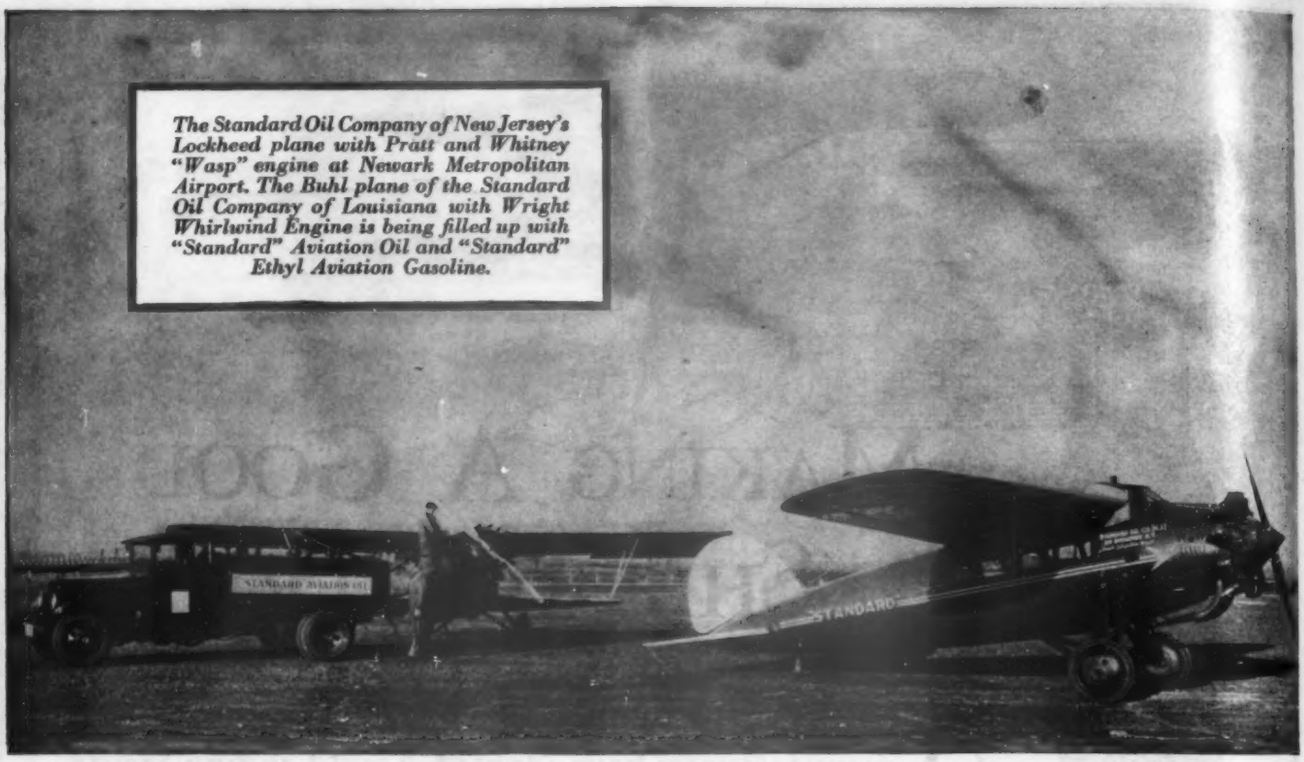

The Standard Oil Company of New Jersey's Lockheed plane with Pratt and Whitney "Wasp" engine at Newark Metropolitan Airport. The Buhl plane of the Standard Oil Company of Louisiana with Wright Whirlwind Engine is being filled up with "Standard" Aviation Oil and "Standard" Ethyl Aviation Gasoline.

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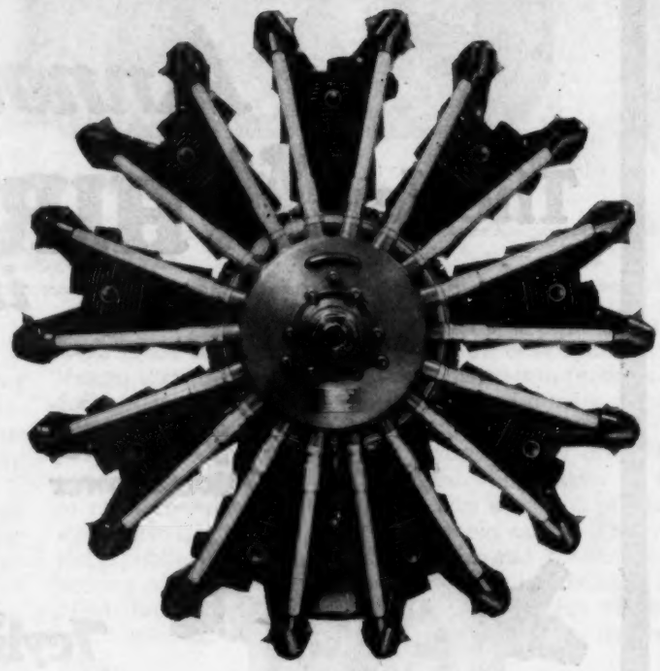

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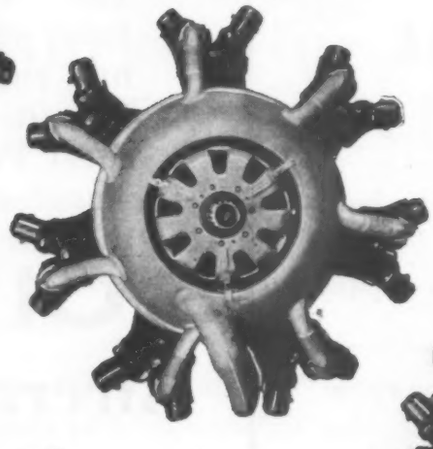

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The Oldest American Aeronautical Magazine

Vol. XXV DECEMBER 8, 1928 No. 24

Greetings

IF THE arrangements, now practically completed, for the sitting of the International Civil Aeronautics Conference in Washington next week are carried out according to schedule, there is no doubt that the time and money of the attending delegates will have been well expended.

Although there have been international aeronautical gatherings held in the past, the atmosphere surrounding the coming affair—the celebrating of the 25th anniversary of flight—should create an even more intense feeling of accord and genuine satisfaction of things accomplished. In such an atmosphere, there should be honest and sincere opinions, regarding existing problems, expressed not with the idea of gaining individual or national benefit, but with the idea of benefiting the entire aeronautical world.

With the reading of the various papers and the discussions to follow, each delegate will acquire first hand knowledge of the conditions and problems existing outside his own country. In other words, when the foreign delegates return to their native shores, they will be rich in information of activities in other lands, perhaps rich in the solutions of their own problems, and unquestionably rich in acquired friendships of those who may speak a different tongue, but are engaged in similar tasks.

Indeed, it is not unlikely that the International Civil Aeronautics Conference will be the tangible beginning of a definite aeronautical understanding between the nations of the earth, and the forerunner of many more internationally profitable gatherings to be held in the years to come. To those delegates who have come from the four corners of the earth to take part in the Conference, AVIATION extends a sincere and hearty greeting, and expresses the hope that they will derive from meeting the members of the American Aeronautical as much benefit as we feel sure the members of our industry will derive from meeting them.

Airline Operation

ALTHOUGH the methods employed in the manufacture and sale of airplanes are, to a great extent, similar to the methods used in the manufacture and sale of automobiles, when it comes to the subject of operation the airplane parallels the railroad.

Years ago when the steam train was making its first appearance, the public was just as skeptical of its safety and practicability as it has been the latest means of transportation. The problems of the railroad operators were just as trying and involved as those that face the airline operator today. The public had to be educated to the advantages of traveling by rail. Once that patronage was obtained, the operators had to not only live up to their claims, but to continue to develop their lines so that better service could be rendered, and thereby an increased amount of traffic obtained. The efforts to improve railroad service have never ceased, and although mistakes were made during the early years of development, the lessons that they taught have been turned into profit in the form of increased safety, more comfort and more efficient operation of the railroads throughout the country.

No other means of modern transportation can better serve as a guide to the airline operator. A study by him of railroad history, and the manner in which its problems were solved, would prove of inestimable value. The traveling public demands safety, comfort and speed. By a process of "bug-bear" elimination the railroads have fulfilled those demands, and by a similar process of "bug-bear" elimination the airline operators can do the same thing.

Unnecessary Chances

ALTHOUGH a comprehensive analysis of aircraft accidents, giving detailed descriptions of the various causes, has never been made, it is safe to assume that a good percentage of fatal aircraft accidents are due to forced landings in strange territory during bad weather. It will be readily agreed that a forced landing on rough, unfamiliar country is a difficult enough task in itself, and that when the elements must also be combatted, the chances of success are practically reduced to a minimum.

It has been proved in the first few months of operation of almost every new airline, that there are certain weather conditions through which even the best pilots cannot fly. This fact is well established, but there are still many fliers who feel a sense of pride in pushing through in spite of impossible weather. Until better weather reporting facilities have been developed, it is foolish, rather than courageous, for a pilot to risk his neck and his plane when he knows there is but a slim chance of getting through.

The prime object of an airway meteorological service is to safeguard the destruction of human life and cargo. The proper functioning of such a service acquaints the pilot with flying conditions over the route he intends to fly. It informs him of what sort of weather he may expect to encounter so that he may plan his flight accordingly. In short, a meteorological service "looks ahead" and "keeps ahead" of the pilot for every foot of the way.

Weather reporting is a matter which is now in the infant experimental stage as far as aeronautics is concerned. Thus far, highly satisfactory results have been obtained, and the time does not seem far distant when an accurate and dependable coast to coast weather reporting system will be in operation. However, regardless of how good a weather reporting service may be, it will be of no particular value to the pilot who takes an unnecessary chance, and takes-off "in the face of bad weather reports." The pilot who does that is foolishly gambling with his life, and, incidentally he is not helping one single bit in the task of reducing airplane accidents to a minimum.

American Albatross B-I

An Exceptionally Well Streamlined Eight Place, Cabin Monoplane Designed for a Pratt & Whitney "Wasp" Engine

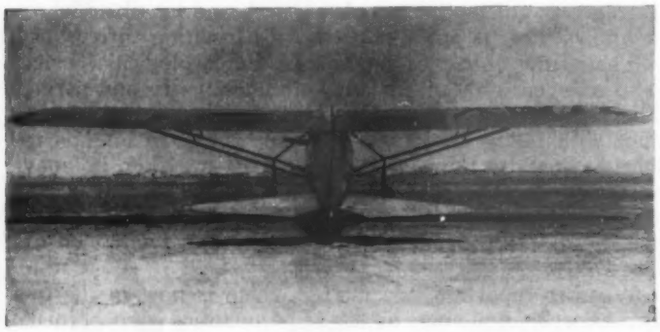
By CHARLES F. McREYNOLDS

CLIMAXING a long series of successful test flights, the American Albatross B-1 monoplane is now being prepared for a second attempt to break the world's record for duration of flight. The attempt is to be made from Rockwell Field, San Diego, with Lee Schoenhair and "Johnny" Gugliementi at the controls.

Designed by Charles Rocheville and constructed in the Long Beach factory of the Albatross Aircraft Corp., the American Albatross B-1 is a single-engined, eight-passenger cabin monoplane, of externally braced, high wing type. It is designed for the Pratt and Whitney "Wasp" engine as standard equipment, but has been flown with great success with a Menasco-Salmson engine developing 260 hp. at 100 r.p.m.

Conventional structure and materials are employed in this plane, which has a fuselage of welded steel tubing and wood wing, fabric covered. The structural arrangement is, however, unusually clever, and the streamlining is exceptionally good. The efficiency is greatly increased by using lift struts in bracing the wing. Length overall is 39 ft., height 11 ft., and span 56 ft. With a weight empty of but 2,362 lb., this plane will carry a pay load of 2,000 lb., and has a normal gross weight loaded of 4,720 lb., which is a rather remarkable pay load-weight ratio. A minimum safety factor of seven surpasses the Department of Commerce requirements for Class 3 airplanes.

Performance of the plane, powered with the Menasco-Salmson engine and carrying full load, has been carefully determined by a long series of flight tests extending over a period of more than 90 hr. These tests have shown a



A rear view of the American Albatross B-1.

high speed of 128 m.p.h. at 1,700 r.p.m., cruising speed of 92 m.p.h. at 1,350 r.p.m., and landing speed of 40 m.p.h. Neither the landing nor the take-off run exceeded 250 ft., and a service ceiling of 19,000 ft. was reached.

In stability tests the Albatross is said to have flown without stabilizer adjustment with loads varying from none to six passengers. Large horizontal control surfaces, an unusually long fuselage, and the dihedral, which is 1½ deg., are probably responsible for much of the plane's inherent stability.

With fuselage, struts, and running gear finished in dark blue, and wing and tail surfaces in gold, the Albatross B-1 presents a very pleasing appearance.

All parts for this airplane are fabricated on standard jigs, and all design features being incorporated in the production models have been tested on the first plane,

Front view of the new Albatross, showing the well streamlined fuselage.

which is operated under Department of Commerce license X-6772. The first production plane has recently been completed and will shortly be delivered to the A1 Ebrite Aero Corp., of Long Beach, Calif., which will place it in service as a de luxe charter plane for parties up to six passengers.

The monoplane wing is of semi-cantilever type, constructed in two panels and rigidly joined by heavy steel plates. Spars are of box type with heavy spruce caps and 45 deg., three ply, ⅛ in. plywood plates. A modified Gottingen high lift curve is used on the wing, which is not tapered except for a six-foot section at the wing tips which have a true airfoil contour. The ribs are of spruce and plywood of truss form, and are spaced 12 in. apart. Intermediate false ribs are placed along the leading edge and covered with heavy duralumin sheeting top and bottom to a point behind the forward spar. Six bays with single Macwhyte round wire drag bracing are used in each wing panel, with compression members of steel tube construction. The trailing edge is of ¼ in. steel tubing.

Ailerons are of wood construction similar to the wing. They are mounted to a heavy false spar by piano type hinges along the upper edge. The entire wing is fabric covered and treated with Berry Bros. dopes. To facilitate shipping, handling, and placing the wing in position for assembling the plane, two lugs are installed on the spars. A third lug at the point of attachment of the rear spar to the fuselage may be used to hoist the entire plane.

No wire bracing is used in the welded steel tube fuselage. The length of the fuselage and its oval cross-

section are conducive to streamlining, which is accomplished by clamping 16 three-quarter inch dural tubes directly to the steel tube bulkheads. These 16 fairing members, with the four steel tube longerons, give a total of 20 fairing members around the circumference of the body, resulting in a surface almost as smooth and unbroken as that afforded by the monocoque type of construction.

The trussing is cleverly carried around the cabin in order to permit the installation of large windows and two large doors without weakening the structure. A diamond truss is employed below the floor of the cabin and all tubing surrounding the passenger compartment is laminated.

All fittings in the plane are of laminated chrome molybdenum steel; and all struts, the fuselage and empennage structures are of chrome molybdenum steel tubing protected inside and out with Lionoil, and then sprayed on the outside with aluminum paint. Fuselage covering is fabric sewed directly to the steel and duralumin fairing tubes.

The wing is secured to the fuselage by four heavy nickel steel bolts at the cabin fittings, one each in the two fittings by which the front spar attaches to the two upper longerons, and two bolts where the rear spar attaches to a fitting carried on a tube structure midway between the two longerons. . The four wing struts are of 2⅛ in., 16 gauge steel tube, with all fittings heavily gusseted and adjustable for rigging. These struts are streamlined with light dural ribs carrying the same lift curve as the main wing, and are covered with fabric.

Passenger Cabin Insulated

The passenger cabin is of spruce and plywood construction, insulated against both heat and noise. The cabin is fastened to the steel tube bulkheads of the fuselage by enclosing them completely with spruce and plywood box ribs. The only internal obstruction consists of the two diagonal tubes bracing the bulkhead. Doors are installed just forward of the rear seat, the service door being on the left and emergency door on the right. Large windows of celluloid give ample visibility, while ventilation and temperature may be controlled by openings at the forward end of the compartment. With six seats installed in the cabin, which has an aisle down the center, it is unusually roomy. A large baggage compartment with three square feet of floor space is located at the rear and is reached from inside the cabin. Two dome lights are provided for night flying, and the walls and ceiling of the cabin are decorated in artificial leather. Seats of duralumin are upholstered in leather.

The enclosed pilot's cockpit is mounted directly in front of the wing and is normally entered through the passenger cabin. Emergency exit is provided by quick opening windows overhead. Seats for two pilots are provided with dual controls of either stick, or Depperdussin type as standard equipment. Large side windows give the pilot excellent visibility. Forward and side windows are of non-shatterable glass and all others of celluloid. All standard instruments are installed including navigation lights and switches and wiring for landing lights.

Engine Mount is Detachable

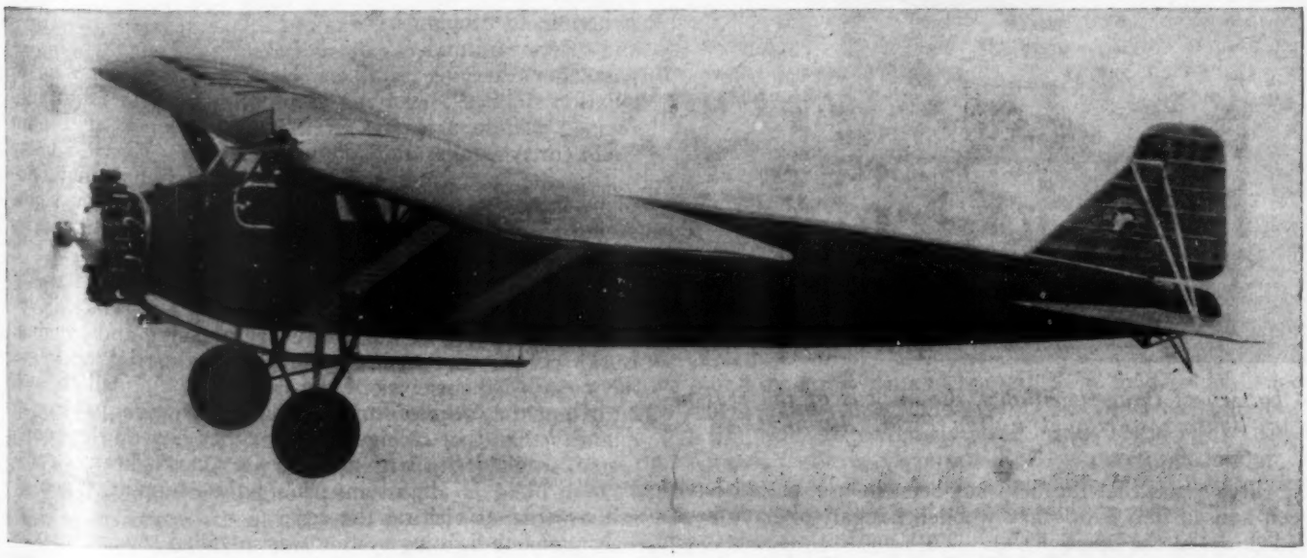
Although the Menasco-Salmson engine is being mounted at present, the plane is designed to carry the Wasp of 400 hp. The engine mount is detachable and the engine exhaust is carried to the rear of the passenger cabin under the fuselage and discharged through a venturi type silencer of bayonet design that has been developed by the Albatross Aircraft Corp. Cowling of aluminum is installed around the engine back as far as the pilot's cockpit. A heavy aluminum firewall is mounted between the engine and the pilot's compartment. Hamilton or Standard Steel propellers are regular equipment.

An 11 gal. oil tank mounted at the top of the fuselage provides gravity flow of oil to the engine. Two gasoline tanks are built into the wing, one on each side of the cabin, and carry a total of 105 gal. of gasoline which feeds to the engine by gravity through copper tubing with flexible rubber joints.

All control surfaces are actuated by wires, which are enclosed within duralumin tube guides open for inspection at each inspection plate. Ailerons are operated by push and pull tubes from the control lever on the spar to the lower edge of the aileron.

A small vertical fin is used at the tail because the long fuselage serves to eliminate yaw. Streamlined steel tubes brace the horizontal stabilizer to the tail post fitting and the fin is braced to the stabilizer by two streamlined wires on each side. Both rudder and elevators are of the balanced type and are mounted on plain metal bearings. The horizontal stabilizer may be adjusted in flight, two degrees up or five degrees down to compensate for heavy cabin loadings.

(*Continued on page* 1954)



Flight picture of the single engined, eight passenger cabin monoplane, American Albatross B-1.

Akron Municipal Airport

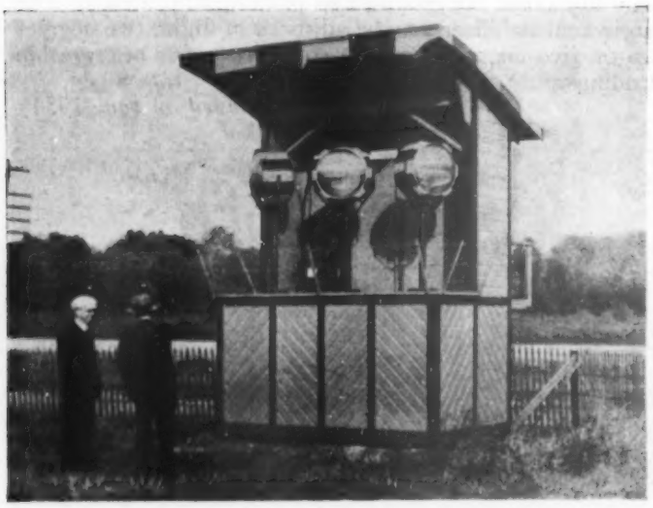
Fulton Field Enters a New Period of Growth With Announcement That the Navy Dirigibles Will Be Constructed There

By WALTER E. BURTON

FULTON FIELD, site of the new municipal airport at Akron, O., is just entering a new period of growth, after enjoying steady progress as a flying field for the past three years. Although activities have lagged somewhat in the past, lost time will be more than made up in the next few years, if everything progresses according to plans. It is hoped that eventually the field will rank with the most important in the world, and will lead others as the center of the lighter-than-aircraft branch of the aeronautical industry in North America.

The reason for the sudden impetus given to development work, aside from normal progress as a result of increasing "air-mindedness" of the general public, is the recent announcement by the Goodyear Zeppelin Corp. that the two 6,500,000 cu. ft. Navy Zeppelins—and doubtlessly many others—will be built at Fulton Field. Within 48 hr. after this announcement was made, things began to bustle at the field, as work of constructing the biggest hangar ever attempted was started. It will be 1,200 ft. long, 360 ft. wide and 200 ft. high. Its erection is in itself a huge engineering task. Preliminary preparations already completed include laying off the hangar site, grading, and the dynamiting of a ditch for sewer and water connections.

Strangely enough, the Zeppelin shed is the first hangar of up-to-date design to be erected at Fulton Field. During the three years that the field has been in use, planes have been housed in a temporary wooden hangar, or have been tied down in the open.



A battery of three floodlights, the nucleus of the present lighting system at Fulton Field, Akron, O.

Selection of Fulton Field as America's Zeppelin center marks the realization of a dream formed five years ago by B. E. "Shorty" Fulton, after whom the field was named. At a time when America's thoughts were seldom directed towards dirigibles, he decided that the flat area of land on the Akron-Massillon road would make an ideal airport, especially for the handling of dirigibles. Two years later, he began to put his plans into operation by leasing a field adjacent to his property and starting airplane flights. Since then he has steadily directed his efforts toward the building of a modern airport, although he has himself preferred to remain in the background. He has done much promotion work at his own expense, such as providing maps and drawings for city officials and aiding them in the selection of a municipal airport site, and by advertising Akron to visiting fliers.

B. E. "Shorty" Fulton, founder of Fulton Field and the present field manager.

At the present time Mr. Fulton is directing operations at the field, and, in addition, gives instruction in flying and offers taxi and passenger carrying service. He has been interested in aviation since 1911, having gone into that field from auto racing. There are now five planes stationed at Fulton Field for passenger and commercial work. Every Sunday during the past winter and fall a Ford tri-engined monoplane has been operated at the field for passenger sightseeing trips. At each visit, the plane has carried capacity loads throughout the day.

Fulton Field is one of the stops on the Continental Air Mail line operating between Louisville, Ky., and Cleveland. Planes stop at the field every morning and evening. Local rubber companies and other industrial concerns have availed themselves of the use of the air mail to such an extent that Akron's mail is, on the average, greater in quantity than that received at any other city on the route. Often special trips are necessary to carry heavy loads. Fulton Field is almost invariably the stopping place of military planes visiting the city.

A complete lighting system was installed several months ago in accordance with Department of Commerce requirements. This system, which is capable of expansion

to meet the needs of a larger field, centers about a battery of flood lights located east of the present flying area. An illuminated wind cone also is provided.

Perhaps the most important feature of the airport, at least from the standpoint of convenience, is its nearness to the center of the city. It is located within sight of several of the largest rubber factories, and within four miles of the downtown business section. It it unique in that it is situated wholly within the corporate limits of the City of Akron.

Because of the nearness of the field, and also because of the absence of nearby electric and bus lines, the transportation problem was solved by the inauguration of a service believed to be the only one of its kind ever attempted. Arrangements were made with a local taxi-cab company whereby visitors to the field are carried at a charge of only 25c per person, one way, from any point in the city. This has resulted in a noticeable increase in business. Plans are now being discussed for the extension of city street car and bus service to the field.

By a recent act of the Akron city council, 700 acres of land were purchased for the airport, the money being provided by a $900,000 bond issue. Of this land, 100 acres have been set aside at the south end of the area for the use of the Goodyear Zeppelin Corp. as a hangar and workshop site. The remaining 600 acres will be developed into a modern airport. If it ever becomes necessary, land is available for increasing the field acreage beyond the 1,000 mark.

Northern Part for Heavier-than-Air Craft

Heavier-than-air activities will center at the northern end of the field, where a passenger station, weather station, offices, and numerous hangars will be erected. Already the city has received application for the assignment of hangar space to the Akron Aero Sales Co., which plans to build a modern hangar of conventional design. Other hangar applications are reported to be in the offing. With the operation of both lighter and heavier-than-aircraft, the municipal airport will naturally be divided into two major portions, that occupied by the Zeppelin plant, and that used for commercial airplane activities.

Of course, the center of interest of the field will be the huge Zeppelin hangar, which is to be completed early next year according to the present plans. Adjacent to this will be workshops of the Zeppelin works, and a mooring mast probably will be erected nearby. The hangar, being of such enormous size, will not be heated in winter. It is possible that it will become the nucleus of future commercial airship operations between this country and others. The new hangar will serve to draw thousands of visitors to Fulton Field early in 1929.

Facilities for the training of pilots and mechanics are rapidly being expanded in Akron. On October 1, the Akron School of Aviation, the first organized air school in the city, opened. A month later the enrollment had passed the 100 mark. The school offers a 70 hr. ground course covering aerodynamics, engine construction and operation, navigation, instruments, and the like. One unusual piece of equipment consists of a small wind tunnel in which an air velocity of 70 m.p.h. may be produced, and provisions for mounting a model airplane in the wind stream so that a student can manipulate controls of the model, duplicating operations necessary in flying a full sized plane. The ground course is followed by flying instruction including 10 hr. dual, 10 hr. solo, and the usual solo requirements for licenses. Ground instruction is given at the school headquarters in the business section of Akron, and flying instruction at Fulton Field.

J. Grant Hyde is president of the school, and Lt. R. W. Barnes, former war flier, is dean. R. P. Haupt is the engine man, and J. Gordon Gaines is business manager. Dr. Wolfgang Klemperer, advisor, formerly was in charge of the wind tunnel at the University of Aachen in Germany. Among other things, he has built record-breaking gliders. W. A. Ritter is treasurer of the school, F. O. Miller is rigging instructor, and "Hap" Rountree is flying instructor.

In connection with local educational activities in aviation, the University of Akron is forming plans for giving a lecture course for the benefit of persons who desire to

A reproduction of a blueprint showing the present development of Fulton Field and the proposed expansion.

obtain general aviation information largely for cultural reasons. The course, which is to be termed an "institute," will consist of a number of lectures, delivered in the evening, covering the entire field of aviation in a general way. Lecturers will be men who are engaged in various phases of aviation activity, and will undoubtedly include both dirigible and airplane experts. No attempt to give a specialized aviation course will be made. The date for the opening of the lecture series has not been announced, but it is expected that the first meeting will be held before the new year. L. L. Holmes, director of university night school activities, will be in charge.

Weather conditions in Akron, and especially at Fulton Field, are unusually favorable for flying, and are said to be better for dirigible operation than those prevailing at the Lakehurst Naval Air Station and other places where airships are flown and housed. The field, which is located in a saucer-like hollow with low hills surrounding the rim, is itself extremely level, and is subject to fairly even winds. Several aeronautical experts, including Rear Admiral William A. Moffett, U. S. Navy, have expressed approval of the field as a dirigible base.

At the present time, Fulton acts as weather observer, a complete set of meteorological instruments having been

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Testing Equipment *for* Aircraft Engines

By J. H. GEISSE

Naval Aircraft Factory, Philadelphia, Pa.

WITH the influx of new money into the manufacture of aviation engines an old misunderstanding is arising. It is unfortunate that in quite a number of cases it has not been satisfactorily settled; in some possibly because the engineers themselves have not had sufficient experience, and in others because the engineer was loath to face the issue at the start. I refer to the necessity of providing satisfactory test equipment.

Very few capitalists understand that engineering is not sufficiently advanced to permit the design and fabrication of an engine with assurance that it will be satisfactory in all respects right from the start. As a rule they are quite firm in their belief that if the engineer is capable and worthy of their support he should be able to lay out an engine which can be fabricated from the drawings without revision and which when fabricated will give 100 per cent. performance. The expenditure of money for adequate testing equipment is to him unnecessary and an indication of lack of confidence of the engineer in his own ability.

Misunderstanding Extremely Unfortunate

The result of this misunderstanding is very unfortunate. In some cases experienced engineers who are just the ones who should receive financial support fail to get it because they will not guarantee the next-to-impossible, and they therefore lose the confidence of the capitalists at the start. In other cases engineers who know the limitations of our present knowledge of stresses in internal combusion engines evade the issue at the start only to have it overtake them when the first engine comes out of the assembly shop. Then comes the request for additional funds for development work, explanations which are viewed with suspicion and a general loss of confidence on the part of the capitalist in the engineer and in the whole undertaking. He sees all the money he has put in gone when he expected that returns were about to be realized. In many cases he withdraws entirely, feeling that continuance of the project would simply mean throwing good money after the bad. His whole frame of mind is unsuited to receive the explanation which should have been made at the start.

I can not impress too strongly on the minds of those who contemplate putting money into an aviation engine development that they had best view with suspicion the engineer who does not require testing facilities rather than the one who does. Aviation engines by their very nature are a compromise between durability and lightness. If an engine were designed so that there would be a minimum chance of failure it would be too heavy to find a market. The highest permissible stresses must be used to secure the lightest power plant and, in many members, calculation of the exact stress is impossible. Even where it appears that the stresses may be calculated the successful designer of today lets his experience rather than the stress calculations dictate the design. Failures beyond number have occurred in parts in which the calculations show large factors of safety. The designer is therefore faced with the problem of estimating how strong each part should be. If he is too conservative the engine will be too heavy. If he is not, a failure may occur and it is not necessarily a reflection on the designer when this happens. As a matter of fact the part that fails may be better designed than the part that does

A top view of a radial air cooled engine, showing the damage incurred after the cylinder blew off.

(*Continued on page* 1948)

Airplane Accidents

A General Review of the Various Causes and Some Sound Advice on How to Safeguard the Pilot, Plane and Passengers

By PILOT CLEVENGER

Alexander Aircraft Co.

HISTORY is a record of the undertakings of mankind with a post factum view of the outcome and results of said undertakings. In view of the fact that history repeats itself, it is self-evident that the study of history gives its readers a preparedness and foresight into the happenings of the future. The military leader studies the history of warfare. The statesman studies the history of governments. The successful man of finance studies the history of business. The airplane pilot, old and new, should be a student of aeronautical history in order to develop his senses of foresight and preparedness.

Undoubtedly the largest percentage of aviation accidents are the direct result of inability on the part of the pilot to fly correctly. It is very seldom that a poorly trained or undertrained pilot ever becomes expert enough to feel at home in the air.

A study of aeronautical history may induce the young pilot to learn perfect flying and to be cautious where caution is needed. It is with the hope of such a result that the following causes of air accidents are chronicled.

An Article on the Tail-Spin

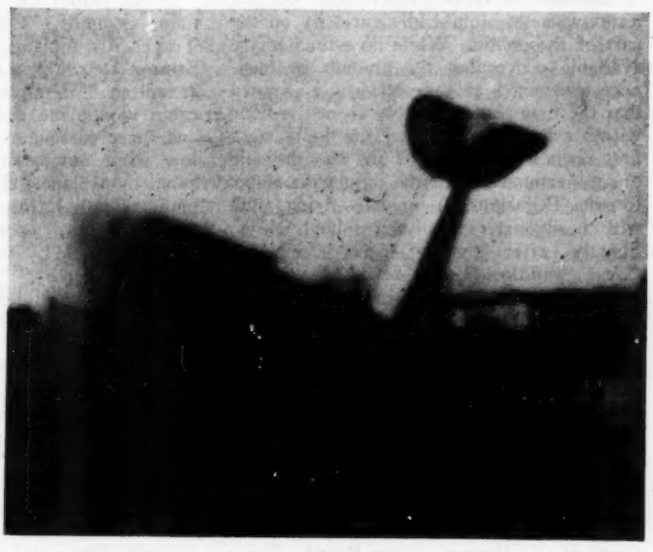
I have always retained a vivid memory of an article I read before the War in an English magazine, "Flight." It was an account of the first recovery from a tail spin. The maneuver was called an "extremely tight spiral, nose down." Previous to that time all tailspins had been fatal. The pilot's name was Lieutenant Porte of the British Army. He went into a steep banked turn and made the common error of trying to elevate the nose by pulling back on the stick instead of releasing his inside rudder. He fought the ailerons and elevators all the way down and as a last resort, when a crash seemed inevitable, he reversed the rudder and recoverd from the spin.

When I was trained during the war, we did a good bit of spiral spot landing practice, previous to any instruction in spins and other aerobatics. I recall at least one case where I stalled while doing a spiral glide. The controls became sloppy and the plane started to fall off into a spin. I recognized what was happening and immediately recovered with opposite rudder. Just this one instance in my case as a young pilot will illustrate the value of analyzing the history of errors in piloting.

The actual recovery from a spin is well understood and there is no need for a thorough review of that subject here. In simple words the rule of recovery from a spin is "nose the plane down into its path of flight and make the nose go straight by means of the rudder. After stopping the rotation, pull the plane out of the dive in a gradual upward curve to normal flying position." There is no excuse for a pilot spinning in from a high altitude unless he has never been taught this maneuver. If a young pilot has missed this instruction he had better attend some advanced school. It is criminal negligence to graduate an airplane pilot without this instruction.

The study of accident prevention will show that it is not only necessary to be able to recover from a spin. It is essential to anticipate the condition and stop the forthcoming spin before it has even started.

There is a part of the ocean that the mariner respects greatly. It is the surf. The airman has a similar zone to contend with and for which he must have respect.



The result of a stunting exhibition performed at an altitude of 300 ft. The pilot luckily escaped injury, even though the plane was badly damaged.

It is the zone from the ground to 500 ft. elevation. The figures of the exact altitude of this dangerous zone are flexible. It is the zone in which a mistake in piloting resulting in a stall will end in a "close shave" or disaster. The depth of the zone above the ground depends upon the air conditions, the type of plane and the quickness of the pilot. It is in this dangerous zone that piloting mistakes so often crop up. The first series of accidents discussed will be those characteristic of the surf zone of the great air ocean.

One of the greatest mistakes a pilot can make is skidding on his turns. In the first place he can never develop the feel of flying. The body feel in a skidding turn consists of a feeling of being pushed towards the outside of the turn. The pilot has the wrong attitude towards his plane. He tries to turn by forcing the nose around the horizon with the rudder instead of by banking sufficiently. The result of trying to force the nose around the horizon with the rudder is that the plane slides side-

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Chicago Exposition Opens With 82 Planes on Display

Engine and Accessory Exhibits Number 242; Aircraft Sold Immediately

CHICAGO, ILL.—The International Aeronautical Exposition, called the first aircraft show to be staged by the industry through its own exposition corporation, was opened here at the Coliseum and First Regiment Armory Saturday, December 1, at 6 P. M. In the four hours that followed, some 5,000 persons passed through the exhibition halls. Those in charge of the exposition were well pleased with the showing made, and it was predicted that the crowds would number at least 25,000 on each of the remaining eight days, when the doors would be open from 10 A. M. to 10:30 P. M. As AVIATION goes to press, this prediction is is being fulfilled.

The aeronautical exposition with its 82 planes, is said to have created more interest than any other national show staged in Chicago in recent years, and this interest was not simply idle curiosity on the part of the public. While no estimates are available concerning the amount of business transacted at the show, it is known that the first plane was sold from the floor within a few minutes after the doors were first opened Saturday. This was the sale of an Aeromarine Klemm light monoplane, to the Pegasians, a private flying club with headquarters on Long Island, N. Y. Shortly after that, General Airplanes Corp., Buffalo, N. Y., reported the sale of 15 of its "Aristocrat" cabin monoplanes to Lee Francis of Buffalo. Negotiations, it is understood, were started previously, but the transaction was consummated at the show.

Other Sales Made

Among other early sales reported are: three Command-Aires for the Congressional Airport Co.; one Command-Aire to Capt. H. T. Ponder, Forth Worth, Tex.; new Travel Air Type 6000 for Dixie Davis Flying Service, Cincinnati; five American Eagle open cockpit planes to N. E. Keffling, Anderson, Ind.; and one American Eagle to the LaPorte Aviation Club of LaPorte, Ind.

Two hundred and forty-two makers of engines and accessories are exhibiting at the exposition, which occupies all of the available floor space in the north, main, and south halls of the Coliseum and the First Regiment Armory and in addition the Greer Building, which adjoins the southern end of the Coliseum, was leased and is in use for exhibition purposes.

Many New Models Shown

A total of 82 planes, many of which are new models, are on display. Among those being exhibited are the Gates-Day "New Standard," the Aristocrat, "Swallow," the Star "Cavalier," the Capital "Air Trainer,' Phantom-Knight, Monarch, Fokker "Super-Universal" and Fokker Amphibian, Monocoupe, Monoprep and Monocoach, Curtiss "Robin," Ryan "B-1" and "B-3," Sikorsky "Amphibion," Keystone "Pirate," Consolidated "Husky Junior," Alexander "Eaglerock," Aeromarine Klemm, Pitcairn "Super-Mailwing," and the Buhl Air-Sedans.

Other planes on display include Stearman, Vought "Corsair," Sport Waco, Travel Air biplane and monoplane, Ford, Stinson-Detroiter, and Stinson Junior, Hamilton "Metalplane," American Eagle cabin monoplane and two passenger sport and three passenger biplanes, the Fairchild low wing monoplane and two models of cabin monoplanes, Szekely "Flying Dutchman," Heath Parasol monoplane, Mohawk "Pinto," Laird open and cabin biplanes, Martin T4 M1, Butler cabin monoplane, "Arrow Sport," Cabinaire," Driggs "Skylark," Simplex, Wallace "Touroplane," Cessna four and six passenger cabin monoplanes.

Twenty-nine complete aircraft engines, aside from the display of parts and accessories, are on exhibition. These are the "Scorpion," Pratt & Whitney "Wasp" and two "Hornets," Walter, Brownback, Cirrus, Velie five and nine cylinder models, Kinner, Curtiss "Challenger," "Chieftain," and "Conqueror," "Rover," Axelson, Wright J-6 series and the Wright "Cyclone," Warner 'Scarab," two cylinder Lawrance, three Siemens and Halske, two Szekely, the "Comet," Bliss "Titan" and Bliss "Jupiter." It is interesting to note that in the display of engines the Curtiss Conqueror is the only one of the water cooled type.

Hold Special Meetings

In addition to the business of conducting the exposition members of various groups forming the Aeronautical Chamber of Commerce are conducting special meetings. These meetings opened Monday, December 3, with a conference of the publishers' section of the Chamber at the Stevens Hotel. This was followed by an organization meeting of the fuel and lubricating section, a meeting of the fire underwriting sub-committee of the airports committee, and a members' meeting.

Tuesday, the commercial airplane manufacturers' section met. On Wednesday there was a conference of the same group together with representatives of the Aeronautics Branch, Department of Commerce, a joint meeting of the airplane manufacturers, distributors, and dealers, and joint technical meetings of the Chamber and the Society of Automotive Engineers, which concluded its business the following day.

A special session of the S. A. E. and the commercial airplane manufacturers' section, a joint meeting of the S. A. E. and chamber members to discuss standards, and a meeting on airships by members of the aeronautical chamber and the S. A. E. were scheduled to be held Thursday. Friday, the National Airports Conference was to be held in the morning and early afternoon, while the airports section and representatives of the National Board of Fire Underwriters were to meet in the late afternoon.

Ship American Eagle to China

KANSAS CITY, MO.—An American Eagle plane has been sold to the L. E. Gale Co., Hankow, China, following negotiations with D. H. Hollowell, sales manager of the local company. The plane, now being shipped, is a three place biplane powered with a five cylinder Kinner engine.

The L. E. Gale Co., furthermore, has been signed as China representative for the American Eagle Aircraft Corp. American Eagles were recently sold in Honolulu and Sydney, Australia.

Reciprocity Permits Licensing of Avians

NEW YORK, N. Y.—A reciprocal agreement has been reached whereby Avian planes may be licensed in the United States and American planes in Great Britain, according to an announcement here by Air Associates, Inc., American agents for Avro Avians, to the effect that British Air Ministry is to issue airworthiness certificates which will thus clear the way for importation and sale of Avro Avians in this country.

The agreement is the result of negotiations between representatives of Air Associates and Sir John Broderick of the British Embassy. A certificate will be issued for each plane, and the craft is further subject to visual inspection for proper rigging and assembly upon reaching this country. The agreement covers planes already imported by Air Associates, as well as those on order from A. V. Roe and Co., Ltd., Manchester, England.

Metalplanes for New Line

MILWAUKEE, WIS.—Announcement is made that Hamilton Metalplanes, carrying seven passengers and mail, will be operated by Northwest Airways, Inc., over the new Milwaukee, Fond du Lac, Oshkosh, Appleton, Green Bay air service extension to be opened December 15.

More Conference Delegates Named

Seven Additional Countries Name Representatives to Enter Parley

WASHINGTON, D. C.—As we go to press, seven more countries have named official delegates to the International Civil Aeronautical Conference scheduled in Washington December 12-14. They are as follows:

Dominican Republic—Official: Maximo L. Vasquez Gautier, Dominican Minister to France, Italy, Switzerland, and Belgium.

Estonia—Official: Col. Victor Mutt, Estonian Consul General at New York.

Greece—Official: Angel Anninos, Counselor of Legation, Washington.

Japan—Official: Capt. Nobruichi Kusunoki, Japanese Army Air Force, Assistant Military Attache, Japanese Embassy, Washington.

Nicaragua—Official: Gen. Jose Solorzano Diaz, Nicaraguan Consul General at New York.

Siam—Official: Lieut. Col. Phra Amara and Maj. Luang Deves, Siamese Air Corps.

Turkey—Official: Ahmed Mouhtar Bey, Turkish Minister at Washington.

Others are Named

Six countries which previously announced their delegation have named additional official or unofficial delegates as follows:

Canada—Official: W. W. Cory, Deputy Minister of the Interior; Surveyor General F. H. Peters, and A. M. Narraway, Chief Aerial Serveys Engineer of the Topographical Surveys Branch.

France—M. Franck, engineer in chief of Aeronautics in the Ministry of Air, superseding M. Sabatier, Engineer General of Aeronautics; Gabriel Voisin, airplane and automobile manufacturer.

Great Britain—Capt. F. S. Barnwell, O.B.E., A.F.C., F.B.A.E.S., Royal Aeronautical Society.

Guatemala—Unofficial: Rafael Castillo Lara, Jose F. Linares, and Luis Alberto Castillo Menocal, representing the Empresa Guatemalteca de Servicios Aereos Morales & Cia.

Addional Italian Delegates

Italy—Unofficial: Capt. Giuseppe Cosulich, Societa Anonima Cantieri Navali Triestini; Engineer Morandi, of the Societa Transadriatica di Navigazione Aerea; Engineer Pallavicino, of the Societa Construzioni Aeronautiche E Breda; Engineer Sossiluigi, of the Fiat Co.; Engineer Piaggio and Dr. P. Moro, of the Ditta Piaggio; Commendatire Cella, Signor France Mazzotti and Engineer Pirelli, of the Dittisotta Fraschini.

Venezuela—Official: Lieut. Miguel Rodriquez, Venezuelan Army Aviator.

It is understood from private sources that unofficial delegates will also attend from India, Mexico, and New Zealand.

Davis Trophy

Awarded yearly to the most efficient naval air reserve division, Harry F. Guggenheim's Noel Davis Trophy has been won by the Philadelphia unit for the second time.

Akron Business Club Plans New Air Group

AKRON, O.—The formation of a nucleus for a possible nationwide organization for the promotion of aeronautics was a feature of a recent aeronautical banquet held by the American Business Club of Akron. It was announced that the club would no longer continue under its former name, but that a new title in keeping with its primary purpose of promoting aeronautical activities will be selected, probably by the first of the new year. The banquet was held in honor of officials of the Continental Air Lines which operates the Cleveland-Louisville air mail line through the city.

The presence of prominent Columbus aeronautical men at the banquet indicated that the new organization may affect the two cities jointly, especially since the Columbus business group has been disbanded. The new organization plans to enter a balloon in the next national race, with "Cap" Palmer as pilot. Jere Robinson was president of the Akron Business Club, and Herburt Maxson its secretary.

To Cruise Carribean by Air

NEW YORK, N. Y.—A new Sikorsky "Amphibion," powered by two 520 hp. Hornets and carrying two passengers and a crew of three will leave here shortly on a 10,000 mi. pleasure tour to the Carribean Sea and surrounding countries. The amphibian is especially designed to ride out rough seas.

The owner is J. M. Patterson, who with Floyd Gibbons, newspaper writer, will be a passenger. Lieut. Frederick H. Becker of the United States Naval Reserve will pilot the plane.

Fokker Will Build 32 Place Airplane

Robertson Announces Universal Has Ordered Five for Regular Service

ST. LOUIS, MO.—Five 32 passenger four engined Fokker planes have been ordered by the Universal Air Lines System for use on the transcontinental passenger service, it is announced by Frank Robertson, president of the Robertson Aircraft Corp. for unit of the air line. The officials of the Universal Aviation Corp. and its associates recently met in the board of directors' room of the Robertson Aviation Corp. when the decision for purchasing the planes was passed.

The huge passenger planes to be known as Fokker F-12's, are being specially designed for night flying with accommodations for 16 berths. Light luncheons will be served aboard. Toilet and lounging arrangements, individual reading lamps, and newspaper and writing desks are a few of the conveniences and appointments.

At the opening of the Chicago show, announcement was made that the new plane would be 65 ft. in over-all length and 100 ft. in wing span. The ceiling of the craft is estimated to be in the neighborhood of 18,000 ft. Maximum speed is put at 145 m.p.h., with cruising speed between 110 and 120 m.p.h.

Engines in Tandem

The four power plants, it was said, would be placed in tandem on either side of the fuselage, the engines considered for the plane being those of the Pratt & Whitney Hornet and Wright Cyclone type. Tanks for more than six hours fuel load are called for in the specifications. This will insure a non-stop range of some 700 mi., it is stated.

The F-12 passenger cabin is to be divided into four compartments, each with eight seats and two folding tables. This passenger section is to total 34 ft. in length and is to be 9 ft. wide and 8 ft. in height. Four men are to compose the crew.

Triangle Opens Offices

DETROIT, MICH.—Triangle Flying Service, Waco, Monocoupe, Ryan, and Driggs dealers of this city, have opened offices in the newly completed Fisher building. Their field is on Ann Arbor Road, approximately 15 mi. from downtown Detroit. George Tabraham, partner in the firm, will be in charge of the office.

P. A. A. Buys New Loening

NEW YORK N. Y.—Pan American Airways, Inc., has purchased one of the new 1929 model Keystone-Loening Amphibians powered with Wright Cyclone engine. This plane will be put in service at Miami.

Curtiss National System Outlined

Flying Service Soon to be Operating 29 Flying Services Throughout Nation

NEW YORK, N. Y.—In a statement made to the stockholders of the Curtiss Flying Service, C. M. Keys, chairman of the board of directors, recently outlined the operations of the $6,750,000 flying service. It was pointed out that five fields are now in operation, and that in the spring 11 operating centers in 11 large cities in the United States are scheduled to begin operations.

Negotiations are under way in seven other cities for the establishment of operating centers in the late spring or early Summer in 1929. With the establishment of these flying bases in six other centers, a total of 29 flying services will be under the operation of the Curtiss Flying Service.

A complete system of aerial service is planned in each of these 29 cities. Full facilities for the repair and maintenance of airplanes and engines will be established in these cities in conjunction with a sales organization distributing Curtiss Robins, Fledglings, and Sikorsky Amphibions together with other types of planes suitable to meet public demands.

Orders 150 Planes

To date 150 new training planes which have been approved as the standard training planes of the U. S. Navy, have been ordered from the Curtiss Aeroplane and Motor Co. for delivery to the Curtiss Flying Service within the next six months. Operations will embrace crop dusting, aerial photography, local taxi service and cross-country flying. Flying schools in each of the 29 cities will be established and in addition there will be three advance training schools for training pilots to pass the transport pilot's examinations of the Department of Commerce.

In his address to the stockholders, C. M. Keys stated that the Curtiss Flying Service was at present operating Curtiss Field in Lond Island and fields at Portland, Me.; Bridgeport, Conn.; Miami, Fla.; and Palm Beach, Fla., the two latter being land and water operatings. There is no training school at Palm Beach but a school has been established at Miami.

Fields at the following points are scheduled to begin operations in the early spring: Boston, Syracuse, Buffalo, Cleveland, Detroit, Toledo, Columbus, Indianapolis, Louisville, St. Louis, and Chicago.

Negotiations are under way at the following cities, looking to the establishing of operations in the late spring or early summer: Kansas City, Philadelphia, Washington, Denver, Los Angeles, San Francisco, and Minneapolis. Fields at Tulsa, Wilmington, Portland, Ore., Spokane, Pittsburg, and Grand Rapids are also under consideration.

Zeppelin Plant Begun at Akron

AKRON, O.—Construction has begun here on what will be one of the world's largest hangars—the structure to house the erection of two 6,500,000 cu. ft. rigid dirigibles for the U. S. Navy. President P. W. Litchfield of the Goodyear Tire & Rubber Co. and of the Goodyear-Zeppelin Co., which will build the giant airships, turned the first spadeful of earth.

The huge building, to be 1,200 ft. long, 325 ft. wide, and 200 ft. in height, is being erected on the newly established Akron Airport, less than a mile from the main factories of the rubber company.

Douglas Incorporates To Permit Expansion

NEW YORK, N. Y.—To enable expansion and subsequent entrance into the manufacture of commercial airplanes, the Douglas Aircraft Co., Inc., has been formed to take over the assets and business of the Douglas Company, according to Donald W. Douglas, president.

With the sale of shares and the acquisition of new capital the re-formed organization will start business with a working capital of almost $2,000,000. E. A. Pierce & Co. and Blair & Co. are announced as bankers for the company. Several eastern and Pacific Coast bankers have been added to the board of directors.

Hitherto Douglas Company has been chiefly concerned with the building of military and mail planes for the United States and other governments.

To Test Student-Built Airplane This Month

WAHPETON, N. D.—The first airplane to be constructed by students in the aeronautic ground work course at the State School of Science here will be flight tested some time before the Christmas vacation, according to instructors Sampson and Freeman, who with their class of 10 students are rebuilding the plane. This is the first flying machine to be built in this part of the state.

One wing is now finished and the second wing is in process of construction. New framework on both wings has been necessary and the students are completely building these parts. Work on the fuselage will begin soon. An OX-5 will be installed.

Nansen to Lecture Here

NEW YORK, N. Y.—Dr. Fridtjof Nansen, Norwegian explorer, will deliver lectures in American cities this winter on the proposed expedition of the Graz Zeppelin to the northern polar regions in 1930, according to reports.

U. S. Delegation Advisors Named

Many Technical Leaders of Industry Included in Body of 29

WASHINGTON, D. C.—Secretary of Commerce William F. Whiting, chairman of the United States delegation to the International Civil Aeronautics Conference, has now named 29 technical advisors to the American delegation. The conference is scheduled to be held in Washington December 12, 13, and 14.

The list of the advisors, which includes many of the technical leaders in the industry, is as follows:

Porter H. Adams, N. A. A.; Col. A. B. Barber, U. S. Chamber of Commerce; William E. Boeing, Boeing company; Dr. George K. Burgess, N. A. C. A.; Dr. William F. Durand, Stanford University; Charles H. Chatfield, M. I. T. Daniel Guggenheim School of Aeronautics; Charles H. Colvin, Pioneer Instrument Co.; Dr. W. B. Coolidge, General Electric Co.; Sherman M. Fairchild, Fairchild company; Maj. Gen. James E. Fechet, War Departinment; Harris M. Hanshue, president Western Air Express and American Air Transport Association; Col. Paul Henderson, T. A. T. and N. A. T.; Richard F. Hoyt, Hayden, Stone & Co.; Comdr. Jerome C. Hunsaker, Goodyear Tire & Rubber Co.; Clement M. Keys, Curtiss Aeroplane & Motor Co.; Prof. Alexander Klemin, Daniel Guggenheim School of Aeronautics, N.Y.U; Capt. Emory S. Land, Guggenheim Fund for the Promotion of of Aeronautics, Charles L. Lawrance, Wright Aeronautical Corp.; Dr. G. W. Lewis, N. A. C. A.; Grover C. Loening, Loeing corporation; Glenn L. Martin, Martin company; Dr. Charles F. Marvin, U. S. Weather Bureau; Rear Adm. W. A. Moffett, Chief of the Bureau of Aeronautics, Navy Department; John Francis O'Ryan, Colonial Air Transport; Harold F. Pitcairn, Pitcairn Aviation, Inc.; Fred B. Rentschler, Pratt & Whitney company; Ray Stearns, General Electric; William Bushnell Stout, Stout Metal Airplane Co.; and J. F. Trippe, Pan-American Airways.

Design Stinson Tri-Engine

DETROIT, MICH.—Stress analysis and paper work on a new three-engined, 14 passenger monoplane to be produced as a standard plane by the Stinson Aircraft Corp. of this city, has been completed and production of the first craft of this type will be begun when the company moves into its new $250,000 plant. The monoplane is to be powered by three Wright J-6 engines.

Asks N.A.A. Charter

WASHINGTON, KAN.—This city has made formal application for a chapter of the N. A. A.

Coffman Monoplane Absorbs Southwest

OKLAHOMA CITY, OKLA.—The Coffman Monoplane Co., recently incorporated for $200,000, has purchased the old Midland Motor Car Co. plant for factory purposes and has absorbed Southwest Airways, Inc., at the municipal airport for assembly and hangar purposes.

F. P. Johnson, banker, owner of the Midland plant, becomes one of the stockholders as part of the deal, while R. H. Tarbutton of the Southwest Airways becomes a director and assistant to Sam Coffman, vice president and production manager of the new firm.

All assets of the Southwest Airways, said to be about $15,000, go into the deal. This includes the hangar at the municipal airport with all shop equipment and planes of the company. The Midland plant is to be used as a factory and for assembly work while the hangar is to serve as a field headquarters, engine shop, and assembly of wings to fuselages. The equipment of the Coffman company experimental plant at Clinton is to be moved to Oklahoma City.

Production in the new building, an 85 by 550 ft. structure of brick and concrete construction lying on the M.K.T. railway spur, is to begin about February 1.

Challenger Travel Air Production Under Way

WICHITA, KAN.—Production is now under way at the Travel Air factory on a biplane powered with the Curtiss Challenger engine, which develops 170 hp. at 1800 r.p.m. The plane is similar to the Type 4000 except for the cowling and streamlining which have been improved. Wings of the new Travel Air type or the conventional wings with balanced ailerons can be furnished.

The Challenger Travel Air has a wing span of 34 ft. 8 in., an overall length of 24 ft. 2 in. and an overall height of 8 ft. 9 in. A Travel Air No. 1 airfoil section is used. Wings and fuselage are of standard construction. The weight of the plane empty is 1550 lb. and the gross weight 2475 lb.

The new Travel Air has a high speed of 125 m.p.h., and a landing speed of 45 m.p.h. The rate of climb is 1000 ft. per min., and the service ceiling 17,000 ft.

Wichita Firms Employing Gas

WICHITA, KAN. — Natural gas brought from the Mid-Continent Field plays an important part in the aircraft industry in Wichita. Three big airplane factories here now use the gas for industrial and heating purposes. These plants are the Swallow Aircraft Co., Travel Air Manufacturing Co., and the Stearman Aircraft Co.

Thompson Will Test M-1 Monoplane Soon

LOS ANGELES, CALIF.—Flight tests are scheduled to be run soon on the M-1 monoplane recently completed by the Thompson Aircraft Co. of Los Angeles, according to the announcement of R. Lavin Thompson, designer of the new type plane. Of single passenger capacity and with a full cantilever wing, it is said that the new monoplane is to be produced in quantities to meet the demand for a sport plane.

Specifications show a wing span of 20 ft., a length overall of 10 ft., 3 in., and a height of 4 ft., 6 in. The wing is mounted 4 in. above the thrust line and is tapered in plan and form. A single piece cantilever axle is to be used and 36 by 4 in. tires are to be used on the landing gear. It is said that the new plane will land at 32 m.p.h. and show a top speed of 121 m.p.h. with a cruising speed of about 105 m.p.h.

Price of the Thompson M-1 is set at $2,000 equipped with the 3 cylinder Anzani engine.

To Try Again in Albatross

FRESNO, CALIF.—Charles Rocheville, builder of the Albatross B-1 in which Lee Schoenhair and John Guglielmetti recently stayed aloft 43 hr. in an endurance attempt, announces that a new duration flight will shortly be made with 100 more gallons of fuel in the tanks. Finding their gasoline insufficient for the completion of a new record, Schoenhair and Guglielmetti finally gave up the previous attempt.

Showing the new Challenger powered Travel Air.

Ground Broken For Knoll Plant

Skilled German Aero Experts Selected for Staff of Company

WICHITA, KAN.—The Knoll Aircraft Co., Wichita's newest commercial aircraft concern, has just purchased 148 acres of land for an airport adjoining Travel Air Field to the south. Less than an hour after the land deal was closed, Art Goebel, well known flier, broke the ground for a new three-unit factory.

The Siedhoff Construction Co. has the contract for the new factory. A paint and dope room, 50 by 100 ft., will be built first. The main factory building will be 150 by 200 ft. The third structure will be the office and administration building.

The factory, according to Felix W. A. Knoll, German designer and vice president of the company, will have a cantilever roof, permitting large planes to taxi in and out of the building. Construction of a 24 passenger amphibian plane is planned for 1929. All the buildings will be of brick and steel construction.

Other Germans Coming

On the theory that an abundance of technical skill is the secret of success in aircraft manufacturing, the Knoll company, financed by Wichita men, is building its organization around a corps of well known German aeronautical engineers. Knoll, who has designed experimental planes in Europe, has brought Hubert Schwenke, a young technician to Wichita with him. Alfred Longardt of the Heinckel factory in Germany an old associate of Knoll, has just arrived. Within 60 days the following men will arrive from Germany: Karl Ziller, chief engineer in the Dornier factory; Ernst Froelich, departmental chief engineer in the Rohrbach factory; Egon Winter, in charge of the states department of the Dornier factory, and Dr. Frederick Dawid, aerodynamics and statics authority of Berlin and Vienna.

The concern is also drawing upon Wichita talent for its organization. Charles Quick, Wichita engine expert, is factory superintendent; Howard Jones will be chief test pilot, and Dick Bollby is superintendent of the welding department. Because of a new principle in wing construction, Gerhardt Schmidt is being imported from Germany to head the wing department.

Sales Activity Reported

WICHITA, KAN.—Ray W. Brown, sales superintendent for the central states territory for the Travel Air firm, has returned to the factory with a great part of his 1929 quota under contract. G. O. Harned, sales representative for the eastern area, has returned with a similar report.

Stinson Starting $250,000 Factory

Initial Company to Locate at Industrial Field to Build 10 Acre Unit

DETROIT, MICH.—William A. Mara, secretary of the Stinson Aircraft Corp., recently announced plans for the company's new $250,000 factory to cover a 10 acre site on a newly announced 640 acre privately owned industrial airport, near Wayne, Mich.

Work on the new plant has already begun, and, it is expected the Stinson company will move in about January 15, after which production will be increased to two planes per day. The plant, however, will not be fully completed until a later date.

Officers and directors of the Stinson company have been considering building a new factory for some time. The new plant will be of one-story construction, providing 85,000 sq. ft. of factory floor space. The building is planned to secure a maximum of day lighting, with many features in the layout to assure efficiency of operations, and is expected to represent the last word in aircraft manufacturing plants. The plant will cover a 10 acre site, part of the 640 acres secured for the airport, and will be so located so that it can be expanded to double or triple its initial size, without disturbing operations.

The square mile of airport, which probably will be known as the Detroit-Wayne Industrial Airport, is owned by a group of Detroit business men, whose purpose it is to provide immediately a possible location for aircraft manufacturers or allied interests, and to provide a facility for commercial air service operators. In locating on the site, the Stinson Aircraft Corp. is the first company to avail itself of the privilege.

Keystone and Loening Distributor Appointed

NEW YORK, N. Y.—Cox & Stevens of New York, naval architects and yacht brokers, have entered an agreement with the Keystone Aircraft Corp. to sell Loening Amphibians and Keystone seaplanes and flying boats in the United States, it is announced. As recently announced, the Loening Aeronautical Engineering Corp. and the Keystone firm are now merged, hence Cox & Stevens will represent the two as a single unit.

The type of plane to be initially offered by the new distributor is the Keystone-Loening Amphibian Air Yacht powered with the Wright Cyclone engine, and accommodating pilot, mechanic, and six passengers. One of these craft is on exhibition at the Chicago Show.

To handle the sales, Cox & Stevens has organized an aviation department. It is headed by Robert P. Huntington of that company.

Boeing Carries Huge Propeller

OAKLAND, CALIF.—Preliminary test flights with a new type Boeing Air Transport plane between Oakland and Reno indicate that it gives greater weight carrying capacity and increased speed.

The plane has a huge tri-bladed propeller on its nose. Each blade of this air screw is oversize, and by means of a gear unit turns over at half the speed of the engine. Claire K. Vance, veteran Boeing pilot, is testing the plane.

Describes Compass and Altimeter Experiments

SCHENECTADY, N. Y.—Two new developments of aeronautic interest were announced at the autumn meeting of the National Academy of Sciences by engineers of the General Electric Co. One of these was a method of radio depth-sounding in the air as a means of determining height of a plane above the ground over which it is flying. This method was suggested by Dr. E. F. W. Alexanderson, consulting engineer, in a paper describing his experiments in detecting radio echos by the use of an oscillating receiver in a plane and measuring altitude up to 4,000 ft. by the use of this apparatus.

The other development was a magneto compass described by Dr. J. D. Tear of the General Electric research laboratory. This compass is light in weight and consists essentially of a bar of permalloy, a nickel-iron alloy, containing a rotating armature and so connected that deviation from a predetermined course is immediately indicated on a specially calibrated electric meter in the circuit. The indicator is set by the pilot for any given direction and he is at once appraised of any departure from this direction.

Quarters for Maryland Club

BALTIMORE, MD.—Permanent headquarters of the Aero Club of Maryland will be established at 2116 Maryland Avenue, Baltimore, according to Don Redding, president.

The club has been conducting a flying school at the City Line Airport, Reisterstown Road at Seven Mile Lane. In addition to this, the organization is now forming a ground school, and it is expected that complete aeronautical training will eventually be offered.

Duluth Students Form Club

DULUTH, MINN.—The Denfield Aeronautics Club was recently organized by students of the Denfield High School here. Henry O'Hara, one of the members, has soloed and acted as a mechanic during a barnstorming tour of several Middle West states during the summer.

U. S. Technical Jobs Open to Competition

WASHINGTON, D. C.—An open competitive examination for a position as senior aeronautical draftsman is announced by the United States Civil Service Commission. A vacancy in this position in the Air Corps, Material Division, Wright Field, Dayton, O., at a salary of $2,000 to $2,500 a year. Vacancies occurring in positions requiring similar qualifications will be filled from this examination, unless it s found to be to the interest of the of the service to fill any vacancy by reinstatement, transfer, or promotion.

Competitors will not be required to report for examination at any certain place, but will be rated 70 per cent. on education, experience and fitness, and 30 per cent. on practical tests rated on work submitted.

Applicants should apply at once for Form 2600, stating the title of the examination desired, to the Secretary of the Sixth Civil Service District, Government Building, Cincinnat, O.; to the Secretary, Board of U. S. Civil Service Examiners, Post Office, Dayton, O.; or to the Secretary, Board of U. S. Civil Service Examiners, Wright Field, Dayton.

Application should be properly executed, excluding the medical certificate, and must be filed with the District Secretary at Cincinnati, prior to the hour of closing businness on December 15, 1928.

The Civil Service Commission also announces that open competitive examinations will be held for positions as junior aeronautical engineer and junior mechanical engineer. Applications for either of these must be on file with the Commission at Washington, D. C., not later than January 22, 1928.

Oil Concern Provides Plane for Executives

NEW ORLEANS, LA.—Regular commercial use of airplanes by business corporations other than air transport companies began definitely in New Orleans with the arrival at the Menefee Airways field of an open cockpit Travel Air biplane purchased by the Standard Oil Co. of Louisiana.

This machine will be used by executives of the organization until the arrival of a five passenger Curtiss Robin recently ordered. The Curtiss cabin plane is expected to be in the city within about 60 days. Don Dice, north Louisiana pilot, is in charge of the Travel Air plane at present.

Offers Home Ground Course

KANSAS CITY, MO.—A home study course in aviation is being offered by the Porterfield Flying School, Inc., of Kansas City. The course has been prepared by Capt. L. A. Miller, general manager of the school, after collaboration with a number of aeronautical authorities. That the course will enable prospective flying students to cut their active training time is the belief of Captain Miller.

Organizations Make Personnel Changes

Word is again received of a number of personnel changes in the various organizations of the industry. They are as follows:

VICTOR ROOS, it is reported at Wichita, has retired as general manager of the Swallow Airplane Manufacturing Co. GEORGE BASSETT is to succeed Mr. Roos.

C. EUGENE JOHNSON, pioneer mail pilot, has been named superintendent of the Pacific Air Transport operations force, according to an announcement by A. K. Humphries, vice president of the organization.

E. E. ALDRIN, whose resignation from the Army has been accepted, is now associated with the Standard Oil Development Co., Linden, N. J., as manager of that firm's aviation department.

B. E. "SHORTY" FULTON, founder of Fulton Field, lately named the Akron, O., municipal airport, has been appointed airport manager by city officials.

C. L. CLABAUGH, Platteville, Wis., is the new instructor at the flying school conducted by Clarence L. Wheeler at Monroe, Wis. Clabaugh is a transport pilot.

RAY MASON is the new manager at Reno, Nev., for the Boeing company. "TED" BORGARD and "ED" BLOM have been named flying mechanics on the Boeing tri-engined transports at Oakland, Calif.

Parks Cabin Planes Nearing Completion

ST. LOUIS, MO.—The first two of the new cabin monoplanes to be built by Parks Aircraft, Inc., in a factory now under construction at Parks Airport, are approaching completion and will be ready for test flight on December 16, according to an announcement by Oliver L. Parks, vice president and general manager of the company.

The new plane is expected to have a very low landing speed. The first two are to be powered with Whirlwind engines and are expected to develop a cruising speed of more than 100 m.p.h. After the factory plant gets into production during the winter, a new power plant, as yet unannounced, will be used.

Aerodynamic Theory To be Taught at Reno

RENO, NEV.—At the next semester of the University of Nevada, classes are to be organized for a course of instruction in the theory of aerodynamics. These classes are to be added to those in engineering.

An old DH donated by the Government will be used. Arthur Gay will teach the theory of flying, and Wayne Buerr is to handle the ground course. As indicative of the interest shown by the students, a preliminary course of aviation, conducted by Thomas Buckley during the present semester to test the students' aeronautical interest has an enrollment of 34.

Fish Transport Stinsons Bought

DETROIT, MICH. — Three Stinson-Detroiter monoplanes, equipped with refrigerators for carrying fresh fish, were recently delivered to the Tex-Mex Transport Co. of Brownsville, Tex. The planes will be used to transport fish from Soto de Mariam, on the Gulf of Mexico, to Brownsville, a distance of 350 mi.

Curtiss Would Obtain Holdings in Louisville

LOUISVILLE, KY.—The Curtiss Flying Service has opened negotiations with Cardinal Fliers for the purchase of the Flier's holdings, it was made known at a meeting of the Louisville and Jefferson County Air Board. The Curtiss Flying Service plans to spend $250,000 on improvements at Bowman Field if the company can obtain a 10 yr, lease with an option of extending it another 10 yr. at expiration. The proposal was made to the Air Board by James C. Willson, broker and director of the Curtiss Service, on behalf of his corporation.

Mr. Willson said that the Curtiss Flying Service planned to include Louisville among 25 cities in which extensive air terminals will be established next spring. If the lease for a section of Bowman Field is obtained, a plant which will cost approximately $250,000 will be erected. The building will include shops, administrative offices, and an aviation school.

Flying Grocery Store For Chicago Company

CHICAGO, ILL.—Equipped as a model grocery store, a new Ford plane, being exhibited at the exposition here, is to be sent on a tour of officially approved airports by Reid, Murdoch and Co., for whom it was constructed. Through use of this novelly accoutred plane, grocerymen and their patrons throughout the country will be shown the Reid, Murdoch line of goods.

The "Independence," as the craft will be christened, has been furnished with shelves of canned and bottled goods, tea, coffee, candy, and various delicacies. Nearly 500 cans of fruits, vegetables, sardines, and other products have been stored in the Ford by careful arrangement, yet room is left in the aisle for chairs to accommodate the flying grocerymen who will make the journey.

Name Coast Waco Dealers

LOS ANGELES, CALIF. — Eddie Martin, Santa Ana, and Robert Neiderhauser, Ventura, are reported as new Waco dealers for 1929 by the American Aircraft Corp. distributor of Waco and Fairchild products in Southern California.

N.Y.U. Enlarges Aero Curriculum

Prof. M. W. Watkins and Capt. C. H. Biddlecombe to Teach Air Transport

NEW YORK, N. Y.—Two new courses relating to air transportation have been incorporated into the second-term curriculum of the Daniel Guggenheim School of Aeronautics of the New York University for 1928-1929, according to Prof. Alexander Klemin.

Economics of Air Transportation,, dealing with the fundamental economics governing this phase of the industry, will be taught by Prof. Myron W. Watkins, who is regarded as an authority on inland water transportation.

Air Transport, to be taught by Capt. C. H. Biddlecombe, will include the following syllabus:

Economics survey of a proposed route; tracing of the airway, engineering aspects of terminals and emergency fields; lighting; radio aids; weather service; communications other than air; rules of the air and Department of Commerce regulations; personnel; operations and maintenance of flying equipment; and accountancy and final analysis.

Captain Biddlecombe is recognized as one of the most competent authorities on Air Transport, having had operating experience in Europe with the Civil Aviation Department of the British Government and in this country with the Colonial Air Transport Companies, and is now actively engaged in study of the subject.

Akron Men Organize Aviation College, Inc.

AKRON, O.—The first of a proposed chain of aviation colleges has been incorporated for an initial capital of $10,000 by Allen T. Simmons, R. W. Barnes, and Hugh Robbins, all of Akron. The school is to be known as "Aviation College, Inc." Classes will be started at once.

Most of the capital will be used for school equipment exclusive of planes. Robbins is operator of Stow Field, one of the two airports serving Akron, and the Stow Field equipment, including 10 new Waco planes, will be used for school purposes. Simmons is one of the city's best-known business men, and is financially interested in Stow Field. Barnes formerly was connected with the Akron School of Aviation, but resigned recently in order to join the new enterprise.

Headquarters and class rooms of the new school will be maintained in the Hower Building, East Akron. Plans are being considered for the erection of a school hangar at Fulton Field, Akron Municipal Airport. The organization of other units in the chain of aviation colleges will be undertaken wherever such step seems advisable.

Reviews

The Book Department, Aviation, 250 West 57th St., New York City, can supply all books mentioned except government publications. N.A.C.A. publications may be obtained upon request from the National Advisory Committee for Aeronautics, Washington, D. C.

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National Advisory Committee for Aeronautics Report No. 288. Pressure Distribution Over a Rectangular Monoplane Wing Up to 90 Deg. Angle of Attack. By Montgomery Knight and Oscar Loeser, Jr.

Tests were made in the Langley Memorial Aeronautical Laboratory atmospheric tunnel using a Gottingen 387-FB (flat bottom) airfoil at angles of attack varying from —8 deg. up to +90 deg. The tests and apparatus are described in detail and the results are represented by a number of sketches of an airfoil showing the pressure distribution along the chord and from root to tip. It is concluded that a rectangular wing, by reason of its large tip loads, is uneconomical both aerodynamically and structurally. These high tip loads up to high angles of attack produce large lateral bending moments and longitudinal twisting moments in the wing structure. Above maximum lift such a wing has a high degree of lateral instability and the considerable deviation from elliptical loading results in increased drag and also produces appreciable errors in calculations based in this type of loading.

Begins Move to Offset Unfavorable Publicity

LOS ANGELES, CALIF.—In order to offset the unfavorable publicity given to airplane crash accounts by the daily newspapers, the California Aircraft Operators' Association has begun to furnish Los Angeles papers with more constructive news demonstrating the safety, comfort, efficiency, and pleasure of air transportation. The information thus given out is gathered by sending a questionnaire to all member operators each week.

Arrangements have also been made by which speaking dates are solicited from business groups and social organizations, the speakers being members of the association who are in a position to boost aviation by reciting favorable facts concerning the commercial operation of aircraft.

Bolte to Increase Capital

DES MOINES, IA.—Incorporated for $50,000 in August, the Bolte Aircraft Corp. of this city now proposes to raise its capital to $5,000,000 through a stock campaign to extend over a period of two or three years. The firm, which is planning the development of a new low wing monoplane for training work, would sell this stock in small quantities and probably on the payment plan, thus building up a clientele.

Cliffside to be Helium Source

WASHINGTON, D. C.—The Cliffside natural gas structure, lying several miles northwest of Amarillo, Tex., wil be the main source of helium gas in the United States for some years to come, according to the Bureau of Mines, Department of Commerce, which announces that Petrolia Field is in the last stages of the production that has been carried on here for the past 20 yr.

Stearman Preparing For Greater Growth

WICHITA, KAN.—The Stearman Aircraft Co. of Wichita, which was founded a year ago on a $60,000 capitalization and which has grown to a concern boasting $216,000 in property and physical equipment, is being reorganized for a capital in the six-figure class. Recapitalization, authorized by the stockholders at a recent special meeting, put the concern on a $600,000 basis.

The Stearman company has been turning out three planes a week since its organization. It is just now getting into its closed model line and getting larger planes on the way with higher powered engines. Wrigh engines are used, the new super mail planes being powered with Cyclones. Future plans call for a multi-engined transport. Floor space was recently doubled at the plant in North Wichita, insuring adequate space for production facilities.

Among the immediate improvements contemplated are paint rooms, which also will increase floor space, and a new hangar and sales room to cost at least $25,000 at the new municipal airport.

Carpenter Planning Plane-a-Week Output

LOS ANGELES, CALIF.—Production of a new two place monoplane at an initial rate of one a week is scheduled to start soon after the first of the year, according to the announcement of J. M. Carpenter, president of the Monoplane Company, Los Angeles.

Both open and closed models are to be manufactured, and it is said that the factory price will be about $2600 with either Velie or LeBlond engine. Successful tests have already been made on an experimental plane of the parasol type.

All rights and equipment of the Andiz Airplane Co. have been purchased. W. H. Anderson, designer of the Andiz, will be retained as chief engineer of the Monoplane Company.

Oklahoma Pilots Totalled

OKLAHOMA CITY—There are 63 licensed pilots in the state of Oklahoma, a list compiled by the Oklahoma City Chamber of Commerce shows. Of this number 25 are in Oklahoma City and 22 are in Tulsa.

Trade Tips

It Has Been Reported That—

—Construction of a $20,000 aviators' dormitory is soon to be started at the municipal airport, Santa Maria, Calif., by Santa Maria Airlines, Inc.

—A new hangar, 35 by 40 ft., is to be built at the Grand Forks Municipal Airport, according to J. P. Hofstad, who operates a flying school there.

—Airport improvements to cost about $20,000, and to include a machine shop, are being planned by the city of Cedar Rapids, Ia.

—Expenditure of $200,000 for the improvement of the airport at Seattle, Wash., has been approved by the county commissioners. A hangar, administration building, and loading shed, besides 800,000 yd. of dirt fill to level the field, are planned.

—Detroit, Mich., has voted $5,000,000 bonds for airport development, to include hangars, shops, and paved runways. P. A. Fellows, City Hall, is engineer in charge.

—A. E. McManus, manager of the Culver City Airport, Culver City, Calif., plans to build a 70 by 80 ft. hangar and an office building.

English Civilian Plan Adapted in Wisconsin

APPLETON, WIS.—A group of Wisconsin fliers and airminded business man recently organized the Wisconsin Civic Air Service, with headquarters here, through which service it is planned to give the young men and women of the state similar flying opportunity to that of the subsidized British air clubs.

Thus far nine cities have organized squadrons, these being Marinette, Sheboygan, Green Bay, Fond du Lac, New London Red Granite, Neenah, Menasha, and Appleton. The state group already has 12 planes available with transport pilots ready to give instruction to club members practically at operation cost. Miss Lydia Kalishek, aviatrix and vice president of the Service, was a leader in bringing the plans to completion.

In connection with the flying instruction the members also get a home study course which is supplemented by lectures given by engineers and officials of various airplane and aircraft accessory manufacturing companies. The state organization also has a speakers' bureau.

Complete Stanford Air Map

PALO ALTO, CALIF.—An air map 13 ft. square, covering the entire Stanford University of nearly 30 sq. mi. has just been completed by Maj. H. A. Ericson. The work was begun last July. A 12 ft. map of Palo Alto was also completed.

AIRPORTS AND AIRLINES

Officially Open Pontiac Airport

Four Services Are Operating at $225,000 Michigan Air Base

PONTIAC, MICH.—The City of Pontiac Municipal Airport was officially opened by the recent flight of the first air mail plane to and from the field. The airport is now equipped and conditioned for 24 hr. service and is being used daily by the planes of the Thompson Aeronautical Corp., operating C. A. M. 27, and by the planes of three other services.

The first mail cargo consisted of 215 lb. 8 oz. of first class mail. On the opening day the field was visited by a squadron of 18 Army pursuit planes from Selfridge Field, which performed group evolutions. A Ford plane also visited the field and took city officials on a sightseeing trip.

The municipal airport at present comprises 160 acres, all of which is graded and in condition for all-way landings. Eighty additional acres are being acquired by condemnation, which will give the field dimensians of 2,600 ft. east and west by 3,500 ft. north and south.

The Austin Co. of Cleveland were contractors for the brick and steel hangar, 100 ft x 100 ft. with 20 ft. clearance, capable of housing up to 12 planes. The hangar has an operating office, pilot's quarters, hot and cold showers, and is equipped with a remote control switchboard by means of which all the lighting equipment of the field may be operated.

G. Donald Kennedy of the Pontiac City Water Works, designed the field and was in charge of its development. He will be the airport manager and the field will have operators on duty 24 hr.

Field Well Equipped

Marking equipment consists of standard airport markings of the Department of Commerce, including wind cone, circle marker, and name of the city. Boundary lights surround the field and two batteries of flood lights on the south and east are capable of illuminating the entire landing area. They consist of six lamps of six billion candlepower each, giving 36 billion candlepower for each battery. A ceiling projector and a three billion candlepower beacon, mounted on a 50 ft. steel tower complete the lighting equipment. The field is fenced on the two highway sides, and has ample parking space. Lighting equipment was installed by the City Electrical Department.

The field has no obstructions whatever. It is six miles from downtown, on the intersection of two paved roads. The entire field will be turfed.

Capital Opens Detroit Line

DETROIT, MICH.—Capitol Airways, Inc., of Indianapolis inaugurated daily aerial passenger service between that city and Detroit on December 1, using Ford Airport as the Detroit terminal and headquarters.

Two Ryan Broughams have been placed in the service, which calls for departures from Indianapolis at 8:15 A. M. and from Detroit at 1:15 P. M. Flying time between the two cities will average 3 hr., 15 min., according to E. H. Jose, president of the company.

Capitol Airways. Inc., now operates an air service out of Indianapolis to Louisville, Ky., and Chicago.

New York to Panama Line Planned in 1929

NEW YORK, N. Y.—A three day flight service between New York and Panama by next June is planned by the Pan-American Airways which, according to its vice president, J. D. McGregor, has already completed arrangements to use France Feld, the Army's Atlantic station, as a part of this southward extension.

Venezuela on the Atlantic and Chile on the Pacific are to be included in the extension later, but the company will be blocked at Colombia and Ecuador where the Colombian and German Scadta Co. holds exclusive concessions.

Mr. McGregor has been conferring with officials to secure a landing field at David, Province of Chiriqui, and to provide for custom inspection and other necessary formalities to facilitate the departure of passengers landing at France Field.

The fare to Panama will be $400. Overnight stops will be made at Havana and Managua.

Nevada Town Acquires Field

HAWTHORNE, NEV.—This village has recently established a landing field. Hawthorne is on the edge of Walker lake, where the Government is building a munition plant. The first barnstorming pair to visit this town and use the new airport are Joe Lewis, pilot, and Lee Lindley, mechanic, both of Long Beach, Calif. They fly a Ryan monoplane and have done a land-office business hopping sightseers over Mt. Grant and Walker Lake, which is 25 mi. long.

To Open Pawhuska Field

PAWHUSKA, OKLA.—December 17 has been named as the opening date for this city's new 240 acre municipal airport

New Albuquerque Airport is Ready

Secretary Announces Numerous Facilities Available at Southwest Field

ALBUQUERQUE, N. M.—Opening of its new field by Albuquerque Airport, Inc., is announced by the secretary, F. G. Speakman.

The square field, including 160 acres on which are four runways 500 ft. wide and varying between 2,600 ft. and 3,300 ft. in length, is situated on a mesa southeast by east of Albuquerque, one mile south of the race track and five miles from the railroad station. The hangar is marked with "Albuquerque Airport, Inc." Wind cones are located on North, South, and East of the field.

Buildings include a steel hangar, 60 x 80 ft. with a 20 ft. lean-to, and an administration building including recreation and rest rooms.

Ample space has been provided for parking of motor cars. Visitors may view all activities on the landing field without coming upon the field proper, from a space of 800 ft. long located at the northeast corner of the port.

Hangar space may be rented for the nominal sum of $20.00 per month, or $1.50 per day and office space at proportional cost. Those desiring to use the field without hangar space are charged a field maintenance fee, depending upon the nature of the business conducted. Oil, gas and greases are sold at posted prices. The field shops are equipped to facilitate quick repairs to both planes and engines under the direction of licensed mechanics. A service car or plane is available subject to call.

Facilities for Portland Field

PORTLAND, ME.—A large hangar and office building have been built at the local airport, and minor repair facilities are now available. Drainage provisions have been made, and complete lighting facilities, including a rotating beacon, have been installed. The Curtiss Flying Service has been in charge of flying operations.

Omaha-Chicago Line Planned

OMAHA, NEB—Russell J. Walsh, president of Interstate Transit Lines, announces that passenger air service between Omaha and Chicago will be inaugurated next spring. Details of the service are to be worked out during the Winter.

Three-City Field Ground Levelled

Construction of Hangars at West Endicott Will Start Next Spring

BINGHAMTON, N. Y.—Work of preparing the ground surface for the new Triple Cities Airport, to serve Binghamton, Johnson City, Endicott, and adjacent communities, is virtually completed. Obstructions and hazards have been removed, the ground has been leveled, drainage provided, and the field otherwise placed in good shape for use.

It is located at West Endicott, which is about 10 mi. directly west from the center of Binghamton. The airport will serve a community of approximately 150,000 population and is expected to be one of the best in New York. Runways will be from 2,500 to 3,000 ft. in length. Four will be provided, to run approximately east and west, and north and south.

Construction of hangars, machine shop, and administration building at the new airport will be undertaken next spring, as soon as frost is out of the ground. Plans have not as yet been developed for the airport layout. This work is being done by experts employed by Colonial Western Airways, Inc., and the Endicott Johnson Shoe Manufacturing Corp.

The new airport was made possible through interest taken by Endicott Johnson officials, who subscribed 70 per cent. of stock in a holding corporation, to become a subsidiary of the Colonial concern. The airport, it is reported, will become a stop for Colonial planes on the new Buffalo-New York link of the Toronto-New York line, to be inaugurated shortly.

Runway Marker

Showing one of Lieut. J. S. Donaldson's new airport lights recently tested at Roosevelt Field. Each protected by plate glass, the lights are to be used in series to indicate runways.

Colonial Mail Doubled

NEW YORK, N. Y.—Tonnage of mail carried by Colonial Airways more than doubled from one quarter to the next, according to the company's report for August, September, and October, which indicates that its planes carried 44,959 lb. of mail during that period, as compared with a total of 18,066 lb. for the previous three months. Colonial Airways includes Colonial Air Transport, Inc., and Colonial Western Airways, Inc.

The Boston-New York line showed an increase of 15,710 lb. during the three months over the total of 6,327 lb. carried during the corresponding period in 1927.

Extension to Wichita Planned by Braniff

OKLAHOMA CITY, OKLA.—The Braniff Air Lines of Oklahoma will extend its passenger service to Wichita in the spring, according to Paul Braniff of Oklahoma City, Travel Air dealer for Oklahoma. Braniff has just accepted delivery on an another Travel Air monoplane for the service.

Contemplated extensions of the present line, which operates daily between Oklahoma City and Tulsa, are from Oklahoma City to Dallas and Fort Worth, Tulsa to Kansas City via Bartlesville, and Tulsa to Wichita via Ponca City. Braniff expects to have the extension into Texas in operation by the first of the year.

On Braniff's Oklahoma City-Tulsa line, planes are running with 53 per cent. of passenger capacity filled as compared with 21 per cent. the first month, and the list of "commuters" who make weekly or semi-weekly trips between the two Oklahoma cities is increasing steadily.

Rush Work on Mayo Field

ROCHESTER, MINN.—Improvement work on the Mayo Airport here is now being pushed, following the change in schedule which brings planes of Universal Air Lines into this city as an intermediate stop on the Chicago-Twin Cities run. When completed the field will be graded for 4,000 ft. in all directions, and will be one of the best in the state of Minnesota. Hangar facilities as well as lighting equipment for night flying are also being installed.

Plans New Nebraska Service

OMAHA NEB.—An air service from Neligh to Omaha is planned by O. S. Cleveland, automobile dealer of Neligh, Neb., who expects it to begin operations next spring.

Arizona County Asks Bids for New Building

YUMA, ARIZ.—Bids will be called for by the supervisors of Yuma County for the construction of a building suitable for use as the headquarters of the meteorological and radio station at Fly Field, Yuma, to be installed by the United States Government.

Capt. E. R. French, United States Signal Corps, now stationed at San Francisco, recently spent two days in Yuma, arranging the exact location and plans for the structure, with Everett Johnson and Sam Dick of Yuma, who head the technical and financial sections, respectively, of the local aviation committee.

The building will provide living accommodations for two radio operators, two meterological forecasters, and two other military men, as well as housing the necessary equipment. The meteorlogical instruments will be sent from Washington, the radio outfit from San Francisco, and the entire equipment will begin to function as soon as the building can be rushed to completion.

A bond issue to complete the improvement of the airport is under contemplation, and will probably be put to the vote of he people as soon as definite estimate can be obtained as to just what will be necessary to fit Yuma for the highest rating possible.

Curtiss Obtains Lease On Grosse Ile Airport

DETROIT, MICH. — In accordance with expansion plans, Curtiss Flying Service, Inc., has pleased the Grosse Ile airport from the Aircraft Development Corp., Detroit, and will begin operation there early next spring.

In Detroit the Curtiss company will have a circular airport, 3,000 ft. in diameter, surrounded by a wide rim of property highly suitable fo industrial operation. The A. D. C. airport is located at the southwest tip of Grosse Ile, a large island in the Detroit River, about 10 mi. below the business center of the city. A portion of the industrial area is bordered by the River, making the site a logical one for a combined land and water aerial service, such as the Curtiss Flying Service plans to carry out.

Caldwell to Enlarge Field

CALDWELL, IDA.—This city has recently bought additional land so as to enlarge their municipal airport, officially known as Walker Field. A special levy will be added to the regular city taxes to cover this item and to furnish a fund for improvements. The work of sanding the runways, and a large circular marker in the center of the field, is now being done.

The city council has passed an ordinance creating a special aeronautical board to direct and govern the activities of the local port. This board consists of the mayor, two councilmen, and two citizens, appointed by the council.

Lighting Bids Opened For Nebraska Route

OMAHA, NEB.—Looking toward an early change in the route traversed by the transcontinental air mail west of Omaha, the Department of Commerce, through the Chamber of Commerce aerial transportation committee, invited bids for lighting the proposed new airway from Omaha to Lexington, Neb. The bids were to be opened December 7, as we go to press.

Fifteen revolving beacons will be installed on the new airway. Four of these will be at intermediate landing fields, which probably will be located at Lincoln, Seward, York, and Aurora, according to F. E. Caldwell, superintendent for the Boeing company at Omaha. The present route passes through Ashland. Present lighting posts on the more northerly route will be moved to the new line, Mr. Caldwell explained.

Four electric code beacons and one acetylene route beacon also will be installed along the route from Omaha to Lexington which is 210 mi.

Report 31 More Cities Now Planning Fields

WASHINGTON, D. C.—Thirty-one more cities have announced plans for the establishment of municipal airports, according to the records of the Aeronautics Branch, Department of Commerce. They are:

Saint Johns, Ariz., Phoenix, Ariz., Lynwood, Calif., Temecula, Calif., Ft. Myers Fla., St. Petersburg, Fla., Lake City, Ill., Clarinda, Ia., Euston, La., Ruston, La., Andover, Mass., Southbridge, Mass., Bessemer, Mich., Ewen, Mich., Gladstone, Mich., Hibbing, Minn., West Yellowstone, Mont. Kalispell, Mont., Las Vegas, N. M., Lake George, N. Y., Westport, N. Y., Olean-Hinsdale, N. Y., Cliffside, N. C., Sanford, N. C., Westimber, Ore., Sky Top Lodge, Monroe County, Pa., Denison, Tex., Blacksburg, Va., Charlotte, Va., Riverton, Wyo., and Los Mochis Sinaloa, Mexico.

Would Start Service Chain at Mines Field

LOS ANGELES, CALIF.—Following announcement of a string of aero service stations to be erected and operated by the Aeromotive Engineering Co. of America, application was recently made to Clifford W. Henderson, airport director for the city of Los Angeles, for permission to install such a station at Mines Field, the new municipal airport.

According to W. L. Shaffer, general manager of the company, operations will include a complete aero repair shop; facilities for the care, maintenance, and checking of mechanical equipment; a complete stock of replacement parts; motor truck service on planes or engines over wide territory; and conducting of test flights, performance tests, and industrial tests on aircraft and engines.

Football Fans Swell Traffic

MADISON, Wis.—That air travel is rapidly gaining popularity among football enthusiasts is shown by the fact that 29 planes brought football fans here November 24 for the Minnesota-Wisconsin game. Four planes landed at the Madison Airport, two from Milwaukee, one from Minneapolis and a tri-engined plane from Wisconsin Rapids.

Twenty-five planes, the majority of them cabin planes from Minnesota, landed at the Pennco Airport. Three of the planes went on through, depositing a cargo of passengers and continuing to Chicago, while 12 planes remained overnight.

Barren Island Work Will Start in January

BROOKLYN, N. Y.—Work on Floyd Bennett Field, the new municipal air unit, will start January 1, Dock Commissioner Michael Cosgrove announces. The total cost will be $2,500,000, which has been appropriated in the 1929 city budget.

Clarence Chamberlin, city airport engineer, is in charge of the work, with T. F. Feller as chief engineer. Included among the final plans for the field, just announced by Chamberlin, are two hangars for land planes, two hangars for seaplanes, a ramp from the beach into the channel, and several mooring buoys in Jamaica Bay.

A universal beam floodlight of more than 1,000,000 candlepower has been purchased as the principal lighting unit for the new field. The entire airport will cover 378 acres.

Powerful Beacon at Langley

WASHINGTON, D. C.—A Sperry revolving beacon of 1,500,000-3,000,000 candlepower has been erected on a 135 ft. water tank at Langley Field, Va., according to an announcement by the Commanding Officer of the field.

The beacon is visible to airplane pilots from a distance of about 60 mi., and its strength is such that it has been considered necessary to notify various vessels on the Atlantic Ocean and Chesapeake Bay in order that they may not confuse it with the navigating lights of other vessels and lighthouses.

Newton, Ia., to Lease Field

NEWTON, IA.—The Newton Chamber of Commerce is sponsoring project to establish a municipal airport on the Morgan Farm east of here and will subscribe a fund of $5,000 to improve and equip the field. The civic organization plans to take a five year lease on the property. Harry Larson of the Department of Commerce was here recently conferring with local interests on the project.

Skylines Firm Offers Trips Over New York

NEW YORK, N. Y.—New York Skylines, newly formed here, now offers daily sightseeing flights over Manhattan Island in 14 passenger Ford planes, which are heated in winter. The flights are made especially convenient for both the New Yorkers and the visitor to the city; for a bus, leaving Times Square at 2:30 P. M., carries the passengers through the Holland Tunnel to the new Newark Municipal Airport, lying across the Hudson in New Jersey.

The 30 mi. air trip over New York avails views of the many points of interest. The Statue of Liberty, the Battery, Woolworth Building, Times Square district, and Central Park are especially noteworthy from the air. Following the journey, the passengers are taken back to Times Square.

The fares for the trip are: $10 for a single passenger (single ticket), $15 for two passengers (dual ticket), and $22.50 for three (triple ticket). Special day or night parties may be arranged with the company. Regular night flights probably will be offered later.

C. E. Trube heads New York Skylines, which maintains offices at 55 West 42nd Street. With Mr. Trube are associated G. E. Schabbehar and T. H. Stewart.

Hoffman Gets Lease On Superior Airport

SUPERIOR, WIS.—A five-year lease on the municipal airport here has been granted L. A .Hoffman, operator of the Head of the Lake Airways, and plans are now under way for the formation of a $50,000 corporation to operate the airport. A new steel hangar measuring 80x70 ft. will be erected shortly. Besides having room for eight planes it will house a repair shop, office, waiting room, ladies' restroom and a lounging room for pilots and students.

Within a short time a flying school will be started with B. A. Wright, licensed pilot from Chicago, as chief pilot and instructor. The Head of the Lakes Airways has conducted a school in the past but plans for the new school provide for its operation on a larger scale. The airport at present is registered with the Department of Commerce as a first class landing field, according to Mr. Hoffman.

Dedicate El Centro Field

EL CENTRO, CALIF.—Dedication ceremonies were held recently for the newly completed Imperial County Airport, at El Centro, Calif. Civilian pilots and Army planes from Rockwell Field gathered at the new airport for formation flying and a flying program which attracted thousands of persons.

Every part of the 160 acre airport is reported in excellent condition. The Imperial County Airport is used by the Maddux Airlines in connection with its Ford plane service to Imperial Valley points.

FOREIGN ACTIVITIES

Ask Civil Flying Funds for Irish

Diversion of $125,000 Army Appropriation Requested for Subsidy

DUBLIN, IRELAND—Civil aviation, a hitherto negligible quantity in the Free State despite the fact that Dublin's aero club numbers more than 140 members, appears likely to take on a genuine significance, with the report that government officers are entertaining a suggestion that one-fourth of the $500,000 appropriated for army aviation yearly be diverted to civilian activities.

Should the request be granted, the fund would be used to subsidize a proposed line to connect Cork and Dublin with London and the continental system. The probable route would be Cork-Dublin-Birmingham-London, with perhaps an intermediate stop at Chesterfield. There has also been some talk of a service between Dublin and Liverpool, which might be favored instead.

The initial step toward starting an air service has been taken with the registration of a company named Irish Airways, Ltd. But present conditions in the Free State indicate that no such service could be self-supporting, hence the subsidy is asked.

There has been a considerable amount of agitation for establishment of a service between Cobh (Queenstown) and Cherbourg, France, which would greatly facilitate the handling of trans-Atlantic mails. Impetus was given this scheme recently by a member of the Irish parliament who flew the distance over a route on which land is visible all the way.

Air consciousness is being awakened in this country by a group of Irishmen who prophesy that the western coast of their country will someday have one of the greatest airports in the world.

Persia May Permit Airway

TEHERAN, PERSIA—Press reports here indicate that an airway between England and India is assured for the near future. Persia's refusal to grant an air right-of-way over her territory has balked plans for such a service, but it now appears that this refusal will be withdrawn.

Canada Considering Beacons

OTTAWA, CANADA.—In view of the increasing demand for air mail service in Canada, Post Office officials are considering the advisability of cooperating with the Royal Canadian Air Force in the erection of air route beacons for facilitating night service.

Graf to Arctic in 1930

BERLIN, GERMANY—The Graf Zeppelin will be flown into the arctic wastes northeast of Alaska in 1930, according to tentative plans developed here at a conference called by the Minister of Commerce.

Fridtjof Nansen, Scandinavian explorer, will command the expedition, which is under the auspices of the Aero-Arctic Society and sanctioned, though not subsidized, by the German Government.

Australians Building All-Metal Monoplane

MELBOURNE, AUSTRALIA—Depending on public demand and Government support, the Australian Air Services, Ltd., announces that it is prepared to undertake production of an all-metal monoplane next year.

The plane, called the "Lascoter," was designed in this country with particular reference to the flying needs here. Construction on the first plane has been started and is expected to be completed early in February.

Arrangements have been made so that with two or three months notice—allowing time to order additional supplies—the factory hopes to be able to produce at least one plane a week.

Canadians Mapped 53,000 Mi. From Air

OTTAWA, CANADA—Some 53,000 sq. mi. of Canada have been photographed from the air this year by the Topographical Survey, Department of the Interior in cooperation with the Royal Canadian Air Force, according to a report.

The aerial cartography was undertaken to assist in geological mapping, water power investigation, determination of pulpwood and lumber resources, preparation of topographical maps, and experimental work. Vertical photography was used on 22,000 sq. mi. over which great detail was desired, and oblique photography was employed when maps on the scale of four or more inches to the mile were required.

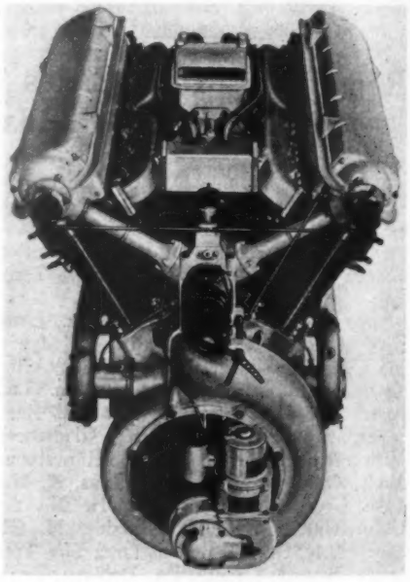
Try Cross-Channel Taxi

CALAIS, FRANCE—An airplane taxi service across the English channel, as distinguished from the regular cross-channel flying service, is being tried between Calais and the Dover by a French company. Small four-seater planes are used. The price is $12 a seat. Reservations are obtainable at the offices on either side of the Channel, or at any travel agency.

Mercedes-Benz Co. Offers New Engine

BERLIN, GERMANY—A new 12-cylinder aircraft engine of the water cooled "vee" type is now being offered by the Mercedes-Benz Co. This power plant has an output of 800 to 1,000 hp. at 1,500-1,700 r.p.m. The bore is 5.44 in. and the stroke 8.19 in. giving a piston displacement of 3,285 cu. in. The weight of the power plant complete including equipment and reduction gear, is 1,800 lb. The fuel consumption is 220 grams (.481 lb.) per hp. hr. and the oil consumption 10 grams (.021 lb.) per hp. hr.

Each cylinder has two inlet and two exhaust valves and all parts, including rocker



The newly developed Mercedes 12 cylinder power plant.

arm mechanism and concentric valve springs, are contained in the oiltight casing of the cam shafts. Crankshaft and connecting rods are mounted in roller bearings.

Four carburetors are used and are placed between the cylinder banks and fed by two fuel pumps. The turbo-compressor is located at the rear end of the engine. A water pump is provided for each bank of cylinders and one pressure and two scavenger pumps are used in the lubrication system.

Re-Assign Peru Concession

LIMA, PERU—The air route concession which has been held here by Huff Daland Dusters Co. of Monroe, La., is reported to have been transferred to the Peruvian Airways Corp., which will extend the service northward along the coast to the terminal of the Pan American Airways Corp.

THE BUYER'S LOG BOOK

Foamite Fire Extinguisher

THE FOAMITE Model CA Extinguisher is of 2½ gal. capacity, having a height over all of 24 in. and a diameter of 7 in. Its weight empty is 19 lb., but when charged it weighs 42 lb. This device produces 22 gal. of extinguishing "Firefoam." The range of its stream is from 30 to 40 ft. Its standard finish is polished copper although it can also be supplied in a red enamel or nickel plated finish.

Foamite Model CA Extinguisher

In general, the Foamite Model CA fire extinguisher consists of a closed copper tank and an inner tube extending down the entire length of the inside. The tank is charged with a solution of water and "Firefoam" powdered chemical "B." At the top of the extinguisher is an opening for the charge. This opening is fitted with a threaded brass collar and closed by means of a heavy brass cap which threads onto the collar. A length of rubber hose, fitted with a nozzle, is attached to the discharge elbow and is used to direct the stream.

The sheet which forms the shell or tank proper of the extinguisher is of the best grade of cold rolled Lake Superior copper properly tempered and of No. 18 B. & S. gauge. After these sheets are rolled in the form of a cylinder, the two edges are riveted together and thoroughly tinned. The edges of the cylinder fit closely and overlap, and the seam is "sweated" with solder which is made to flow through the lapped edges. In addition, the entire joint is heavily "banked" on the inside with solder.

This makes a very strong joint, stronger, in fact, than the copper sheet itself. The top head and the bottom head are formed by stamping and are of No. 16 B. & S. gauge. All joints are thoroughly sweated and banked with solder. The interior of the extinguisher is evenly and heavily coated with a lead-tin alloy as a protection against corrosion.

The inner tube is made from a copper sheet, No. 24 B. & S. gauge, rolled into a cylinder, and the vertical joint is lock-seamed. The inner tube bottom is of copper securely held in place by a bead and by spinning over the edges of the bottom of the cylinder. At the top edge of the cylinder a brass ring casting is soldered in place. The casting has a finished face and forms the stopple seat on which the stopple rests. The inner tube, after assembly, is dipped in molten lead-tin alloy and given special treatment to insure reliable protection against action by the "A" solution. Every Foamite Extinguisher is tested to 350 lb. cold water pressure.

Hanna Portable Riveter

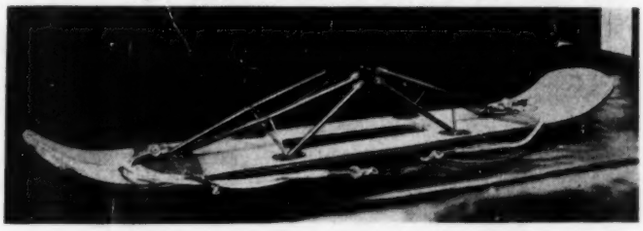
A PORTABLE pneumatic riveter exerting one ton on the dies and weighing only 15 lb. is offered by the Hanna Engineering Works, 1765 Elston Avenue, Chicago, Ill. This riveter has a five inch depth of throat (reach), a two inch gap and a one inch die stroke.

This Hanna riveter is capable of driving tubular bronze or steel rivets up to 3/16 in. in diameter and is adapted to various forms of light riveting.

Mercury Wheel Ski Gear

THE MERCURY Combination Wheel Ski Gear manufactured by the Aerial Service Corp., Hammondsport, N. Y., is a combination of the standard wheel and the standard ski, each mounted and operated in the conventional manner. An opening in the ski runner permits the tire to protrude and only when the snow is deeper than the distance the tire protrudes does the ski come into play. The depth of tire extension varies according to the size of the wheel but in general is equal to the width of the tire.

In addition to preventing nosing over of the plane when landing in deep snow this arrangement permits of easy handling of the plane about the hangar or runways. The skis are made with either wood or duralumin bottom. The bracing is faired with conventional doped fabric when used with the duralumin bottom.

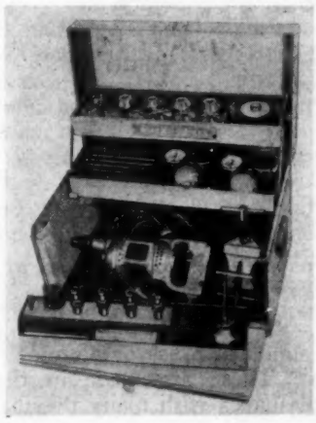


A photograph of the Mercury Wheel Ski landing gear made by the Aerial Service Corp.

The structure has been tested and approved by the Air Corps Division of the U. S. Army, and is now being offered for commercial use.

Black & Decker Valve Kit

ONE OF the most complete valve and carbon outfits ever produced by the Black & Decker Manufacturing Co., Towson, Md., is the DeLuxe Engine Kit, a large convenient metal chest containing valve and carbon tools for many types of engines. This kit contains the equipment necessary to ream and narrow valve seats and valve seating stones and to finish-grind these same seats. The ¼ in. heavy duty electric drill, manufactured by the company, is also included in the equipment.



Black & Decker valve kit opened showing tools.

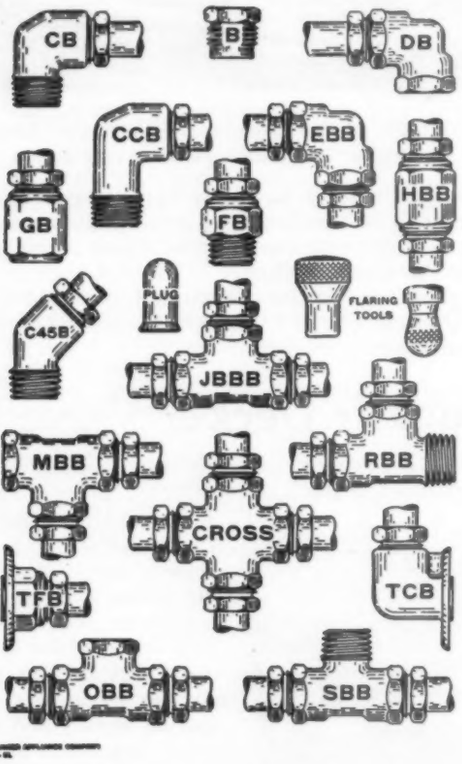
Two sizes of valve testers also are part of the equipment and by means of these instruments each valve and seat is subjected to a compressed air test. Wire brushes driven by the electric drill are provided to clean cylinder heads, pistons, valves and valve guides. The company also manufactures portable electric drills, grinders, sanders, screw drivers and other tools for the equipment of the hangar and airport machine shop.

Parker Tube Couplings

AIRCRAFT MANUFACTURERS in many parts of the country are using tube couplings manufactured by the Parker Appliance Co., 1030 Berea Road, Cleveland, O. The company also produces fuel line cocks, flow indicators, pressure relief valves, tank flanges and other aircraft fuel distribution units so that a complete system can be designed using Parker parts. A full line of hand and production tube benders is also included in the products of the company as an aid to uniform installation of fuel systems.

Parker tube couplings are light in weight and sturdily built and are so designed that a tight metal to metal joint can be made even if the tube is carelessly flared. The coupling nut serves as a die in flaring the tube which is also expanded below the flare by the flaring tool so that vibrational strains are absorbed in the coupling and not imposed on the flared end of the tube. The seat of the coupling and the nose of the nut are slightly molded (within the tensile strength of the metal) so that a secure and tight joint is made. Aluminum tubing can be properly joined by the use of Parker couplings.

These couplings are manufactured in many sizes from No. 2, for ⅛ in. O. D. tube to No. 48, for 3 in. tube.



A display of Parker tube couplings showing system of specification of various sizes and shapes.

For aeronautical installation standard brass or aluminum couplings are recommended. These are made in the standard weight in 16 general shapes with many possible variations of these shapes. Special shapes also can be furnished as required.

The company has been manufacturing these products for the aeronautical industry during the past five years. Distribution and service is being extended throughout the country. Data sheets and literature in loose leaf form are issued by the company and contain information of interest to aeronautical engineers.

Smith Welding Torch

A NEW welding torch having all of the features of the well known No. 6 torch, is offered by the Smith Welding Equipment Corp., Minneapolis, Minn. The new device, which is designated No. 2 Torch, is particularly designed for shops specializing in light welding. It is also well adapted for production work on light metal parts.

The No. 2 Torch is light and sturdy and can be had with a number of tip assemblies. It is however usually furnished with assemblies No. 21, 23, 25 and 27. Tip cleaners, hose connections, wrench and canvas case also are furnished. The shipping weight is 20 oz.

Valves in the No. 2 torch are conveniently placed in the front part of the handle. Each welding tip assembly varies in length and weight directly with size and each has its separate mixing chamber which is automatically changed with assembly. According to the manufacturer this feature assures a soft, true, neutral flame that does not pop or blow the metal being welded. This torch also can be used for lead burning.

Complete welding and cutting outfits, lead burning equipment, acetylene generators, regulators, adapters and other equipment as well as materials for this type of work are stocked by the company. An efficient repair service also is maintained by the concern.

B.B.T. Marker Lights

BOUNDARY, APPROACH and obstruction lights for multiple and series circuits are among the lighting devices manufactured by the B. B. T. Corporation of America, Atlantic Building, Philadelphia, Pa. Clear globes are used in the boundary lights, green in the approach lights and red in the obstruction lights. Clear and colored globes of either plain or prismatic types may be provided.

Series lights are provided with a weatherproof fitting having a galvanized cast iron base for mounting on 1¼ in. pipe. A no-film series cutout socket is used with the standard 600 lumen series lamp. This unit is designed for use on a 2300 volt constant current series circuit.

The multitple boundary light fitting also has a galvanized cast iron base with provision for mounting on 1 in. pipe. A medium base socket is used with standard voltage lamp of from 25 to 60 watts. This unit is designed for voltages up to 250.

"Ideal" Drill Case

THE "IDEAL" drill case, offered by the Union Twist Drill Co., Athol, Mass., affords a means of accommodating wire size drills from No. 1 to 80 inclusive and jobbers drills from 1/32 in. to ½ in. by sixty-fourths of an inch. Provision is also made to keep bit stock drills in the top of the case.

Each drill size is kept in a drawer marked by a noncorroding, two color metal plate fastened to the drawer and stamped in legible figures. Drawers containing wire size drills are so arranged that odd numbered drills are in one vertical column and even numbered drills in the other. Each drawer is made of one piece of sheet steel and swings at one corner. All of the contents can easily be seen when the drawer is opened and it is so designed that it cannot spill.

The entire case is finished with olive cream lacquer. It is less than 14 in. high, 12 in. wide and 12 in. deep and weighs 38 lb. net.

Torchweld Regulator

A DEVICE to prevent building up of excessive pressure in oxygen tanks is now being offered by the Torchweld Equipment Co., 224 North Carpenter St., Chicago, Ill. The safety release valve incorporated in this regulator is automatic in operation. When the oxygen pressure becomes excessive in the regulator body, the safety valve opens, permitting gas to escape through an opening in the back cap until the pressure is again normal.

The regulator body is provided with a three-ply diaphragm of the self-centering type and a simple means is provided to maintain uniform tension on the diaphragm. Brass forgings are used in building the regulator. The safety device is simple, having only three main parts.

Airplane Accidents

(*Continued on page* 1929)

ways to the outside of the turn. When this sort of a pilot tries to force a turn into a field in case of engine failure or a bad cross wind, he kicks more and more rudder trying to complete the turn. The result is inevitable—loss of speed and the start of a spin at 50 or 100 ft. altitude. He does not feel the sloppy controls because he is under too much tension. The plane is sliding sideways away from the desired landing place and he is trying to get back by means of the rudder plus body English.

The antidote is for the young pilot to religiously correct all skids and slips until he consistently makes perfect turns. If he does not know how he should learn. If his instructor cannot show him how, he should change instructors.

Turning back on the take-off in case of engine failure is one of the most common errors in piloting and sometimes happens to old as well as young pilots. Admittedly there is a great desire to turn back to the field in case of engine failure. Almost any pilot in this predicament will subconsciously start to turn back, but he must quickly supress the desire. It cannot be done nine times out of ten. What happens is that he sees he has a lot of turning to do and the ground getting closer and closer. He unconsciously holds it off in trying to complete the turn before he gets to the ground. The result is always a stall and fall out of control from 25 or 50 ft. It must be remembered that on a take-off and for a short time thereafter, an airplane has very little excess flying speed. A pilot may greatly reduce the forced landing hazard on the take-off by planning his path of flight to go between obstacles such as a house, trees, hills, etc. Then in the event of engine failure he has more open territory ahead of him in which to land.

A very serious error can be made when landing out of a spiral. It is caused by trying to crowd in an extra spiral at too low an altitude. This error results in much the same kind of an accident as turning back into the field. The pilot gets close to the ground while he still has a lot of turning to do and stalls trying to complete the turn. It is not good policy to start a spiral under 1,000 ft., as the last part of the turn may be crowded for lack of altitude. A good method of descent is to fly a zig-zag course back and forth across the approach to the field always turning towards the field. The pilot with a dead engine must think fast. If he can glide to a place directly over the landing spot and have 1,000 ft. altitude to start the last spiral—all right; otherwise he had better start zig-zagging in back of the field.

Of course the last stage of any landing is flying straight toward the landing spot at the right speed and the right altitude. All other maneuvers in descending are simply to place the plane in that position. However, do not descend through the "surf" by means of a spiral from such a low altitude that you are crowded in completing the turn.

All pilots pass through the "cocky" stage in which they hang the plane by the prop on the take-off. I was no exception and I consider myself lucky that I did not have engine failure at that time. I have watched the airspeed indicator through such maneuvers and was ruprised at the lack of air speed even in a normally steep climb. A plane with a high speed of 130 m.p.h. and a landing speed of 45 m.p.h. had an air speed of only 60 m.p.h. in a normal steep climb. Hanging by the prop the air speed was near stall. In case of engine stoppage or the encountering of a bad bump or whirlwind, there is so little reserve air speed that the plane is hard pressed to recover and prevent a smash. The older pilots keep reserve speed on the take-offs because they know that the law of averages will give them engine stoppages and unexpected air conditions.

This air condition causes most of the accidents that occur in mountainous regions. The most serious time to encounter a downdraft is during and shortly after the take-off. In other words, while climbing through the "surf" for altitude.

The pilot will be flying along normally when suddenly the plane starts to settle. The engine may be functioning perfectly and the plane have plenty of speed and yet the controls become slightly sloppy and the plane settles toward the ground. The pilot should allow the plane to settle instead of trying to hold or gain altitude. He should avoid taking off toward obstacles or rising ground which necessitates any but a very normal climb. If the pilot tries to hold the nose up while settling in a down draft the plane will stall and mush on into the ground.

Situation May Be Avoided

It is a very ticklish predicament to be in and can usually be avoided by planning the take-off and the first mile or two of flight toward ground which drops to a lower elevation.

An attempt on the part of the pilot to "stretch his glide" is another easy mistake. All students make this mistake sooner or later and it helps explain why instructors become gray. The student will undershoot the field and when it becomes apparent he will pull the nose up to get over the last few obstacles and forget to apply the "gun." In case of a forced landing, where there is danger of undershooting the pilot is very apt to try and stretch his glide.

The only result is a stall and drop out of control from 50 ft. or so. If a crash is unavoidable, it is better to keep the nose down and maintain flying speed until the last moment as a ground crash is far less serious than a spill out of the air. Also the pilot with a "dead stick" should figure to come in toward his landing with reserve altitude and kill it by slipping after he is sure he will not undershoot.

Some of the most capable pilots the world has ever known have been killed trying to land out of a loop, spin or stall, or by doing other brands of low stunting. This fact alone should be warning enough to any pilot no matter how good he thinks he is. The engine may stop at the wrong time. Bad air may be encountered. The closeness of the ground makes the pilot pull out of the stunts more sharply than usual, which usually results in a stall. The plane will then mush right on into the ground.

Overloading is another serious problem. Transportation

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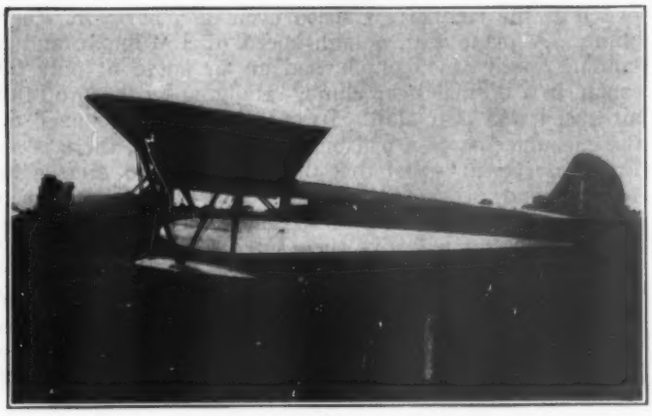

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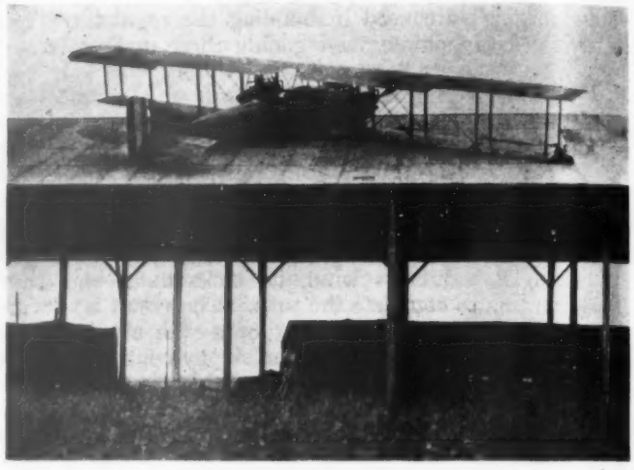
by airplane is a fairly new business and overzealous operators are very apt to overcrowd the capacity of a plane. There was a case of this kind a few years ago in England which caused quite an investigation. One of the oldest and best pilots in England crashed on the take-off, killing himself and all his passengers. The plane was loaded heavily. The pilot of such a plane is in a terrible predicament on the take-off. He is on the verge of a stall. If he does not climb he will hit the obstacles at the end of the field. If he does climb he is apt to stall and the heavy plane will drop like a "ton of bricks." Any pilot will try to climb rather than hit the obstacles. The only protection from this kind of an accident is the



The pilot of this plane tried to "stretch his glide" in making a forced landing. He found it impossible to clear the roof of a shed at one side of the field, and landed on it, only "wiping off" the landing gear.

pilot's ability to say, "No." He knows his plane and what it will do and he must learn to stand on his own convictions.

It can be seen by a review of the preceding accidents that proximity to the ground not only exaggerates the errors of a poor pilot, but also influences the judgment of full fledged experienced pilots. Therefore—learn to fly correctly, do not become reckless, plan your flight a mile ahead through the "surf" whether taking off or landing and last but not least, stand by your own judgment.

There are two things that old pilots, no matter how well they can fly, never wish to sample. One is structural failure and the other is fire. That explains why they sign their letters, "Yours till the wings blow off." Pilots do not like to consider these conditions, but they are worthy of deep thought. Of course, both matters are problems of the engineering branch of aviation, but the pilots might be considered as being in on the deal as long as they fly. Of course, the pilot can always say, "No," if he thinks the engineers are at fault.

On the other hand it is possible to blow the wings off any airplane, so the pilot should take heed as to whether or not he may be at fault. In simple words, rough flying is hard on a plane and smooth flying is easy on a plane. Aeronautical engineers will prove that in recovering a plane smoothly from a fast dive the loading strain mounts about three to one, whereas a sudden, jerky recovery causes the loading strain to mount to about twelve to one. It follows that a pilot may reduce the structural failure hazard by flying smoothly at all times as though he were following a path of flight fashioned after a series of long French curves.

The other great hazard, fire, may originate in a number of ways, most of which may be corrected by the engineers.

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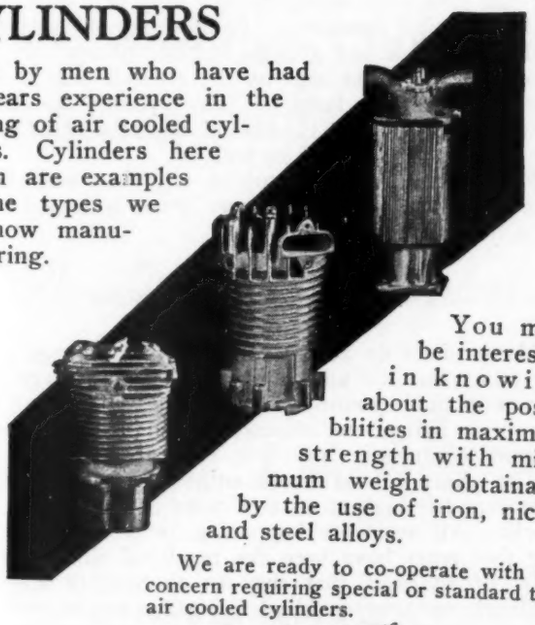

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"Upside Down" Pangborne

"Upside Down" Pangborne of flying circus fame is one of the best pilots in the country. His engine developed a bad knock. The circus was ready to start to the next town. He decided to fly to the next town to be with the "gang" while overhauling his engine. He got about half way to his destination. He had 4,000 ft. of altitude when the engine threw a rod and caught fire. He immediately put the plane in a steep slip to keep the flame from coming back to the cockpits. A hesitation of a second would have meant flame and fumes in his face and unconsciousness. He slipped all the way down even while rounding the glide, until just before landing. As soon as the plane was on the ground he climbed out of the cockpit and jumped off as if it were an old freight car. He turned a few somersaults and stood up sadder but wiser as he watched his plane stop rolling and then explode.

If a man's senses are so dulled that he cannot walk well, how can he fly? Gasoline and liquor have never mixed. I am not a prohibitionist, but I thank my stars that I have no desire to go near an airplane when drinking. I have seen wonderful pilots go up drunk and try to stunt as low as the telephone wires. The only trouble with that procedure is that the human body splatters so. A pilot under the influence of liquor is inclined to throw caution to the four winds.

Flying is an art and a matter of touch, requiring alertness of all senses and reflex actions. There is nothing that effects the actual flying ability of a pilot so much as his physical condition. If he feels fit, he flies fine. If he feels sick and groggy, he flies poorly. If a pilot is seriously ill he belongs on the ground. He is used to flying in a certain fashion. Illness limits his ability to fly as well as usual. He should appreciate this fact and put on the soft peddle if he feels ill.

Engines are liable to stop at any time and the pilot who consistently flies low over town is bound to land on a housetop sooner or later.

Inadequately Secured Luggage

Many pilots fly across country with baggage piled in the front seat not adequately secured and carry passengers with duals connected. No matter how long a pilot has been flying, one mistake of this kind resulting in jammed controls is "plenty to close the book."

The pilots of our transcontinental air mail undoubtedly rate the highest of any cross country pilots in the world. All accidents happening in that service in the last five years have been the result of blind flying. In view of the fact that they so thoroughly know their business, remarks on blind flying are not in order here. I recommend however that all young pilots without the proper experience and instruments steer clear of blind flying. It is better to land while the pilot can see.

It has been said that 90 per cent. of accidents are through faulty piloting. Condition and care of equipment round out the percentage. There is a true axiom which says "one cotter pin can wreck an airplane." All

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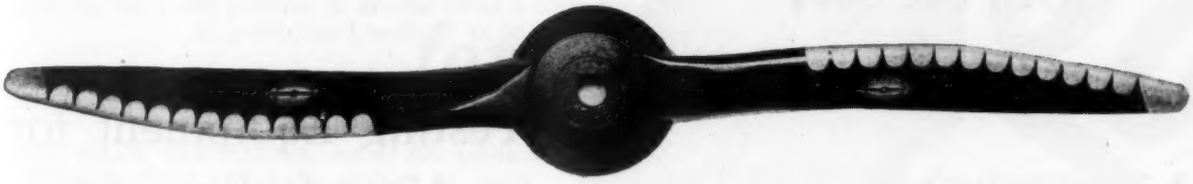

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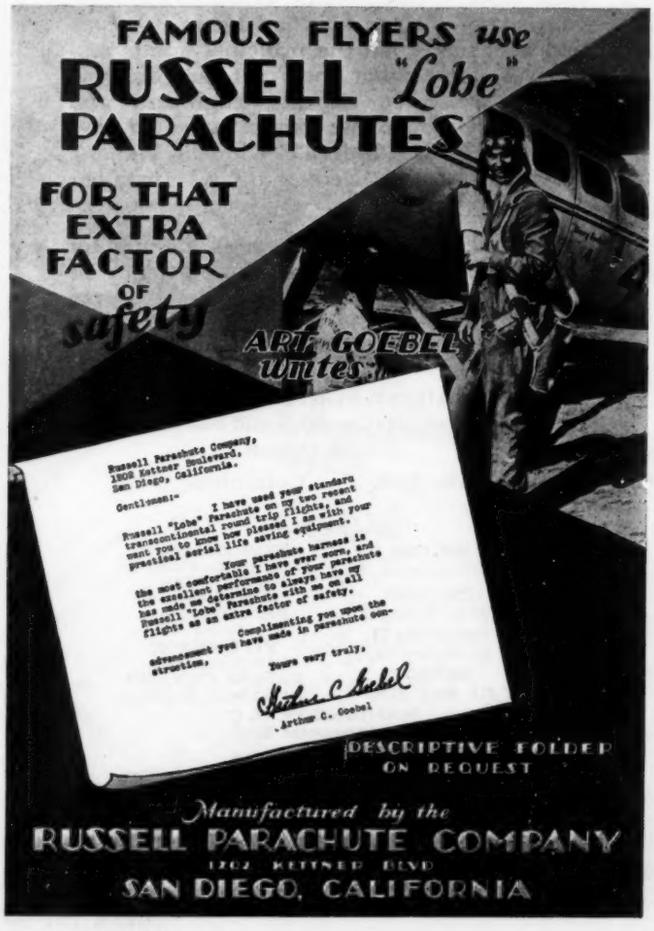

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pilots should know how to inspect an airplane. More than that they should constantly inspect their "steeds" and keep their engines in good shape. I recall an instance, shortly after the War, when I had the engine all warm ready to take off and discovered a missing cotter pin. I immediately cut the switch and inspected the plane from A to Z. The boys at the field kidded me about it and laughingly called me "Careful" Clevenger. They were not kidding me; they were complimenting me. I hope I never become so careless that I do not know what kind of an airplane I am riding in.

Testing Equipment for Aircraft Engines

(*Continued from page* 1928)

not. The part that fails is undoubtedly too weak and is overstressed, but the part that does not fail may err still more by being heavier than necessary.

Even in the automobile industry where weight is not a serious factor, where it is not necessary to get the last ounce of work out of each piece, and where the engineers have the advantage of a background of experience and precedent that is so broad as to make out aviation experience seem almost nil, no one expects the new model to be produced and marketed without numerous changes dictated by road and block tests. Any company operating on such a basis would soon gain a reputation commensurate with its folly. The leaders in the industry, and it may be assumed that the leaders have engineering talent of the highest calibre, find it necessary to test and test and test. Large sums are spent on securing "proving" grounds and each new model may be put through a full year of testing before it is offered to the public. And even then, service complaints are not eliminated. Some parts do get through the testing, and later fail in the hands of the owners.

If these engineers who have made history by their remarkable strides in the perfection of the automobile cannot be expected to be infallible in their designs, why should any one expect that the aeronautical engineer should be, when he has an even more difficult problem to solve?

An Example

At the start of the War the Government called in a group of engineers whom they considered the best in the country. They were engineers that any capitalist would have no hesitancy in backing, and they designed a wonderful engine. Their achievement was one that deserves to be ranked with the greatest of that period when great achievements were too numerous to ever get the acknowledgment they deserved. But was this engine a success as originally laid out? It certainly was not. There were many changes necessary and two of these were in such major parts as the crankshaft and connecting rods. Both were too light as originally designed. And because of lack of sufficient testing, somewhat excusable under the circumstances, many of these parts were put into production and into service. The result was loss of life, time, and money. Engines with these weak parts had to be torn down and the new parts installed as fast as they could be fabricated and delivered to the squadrons both here and abroad.

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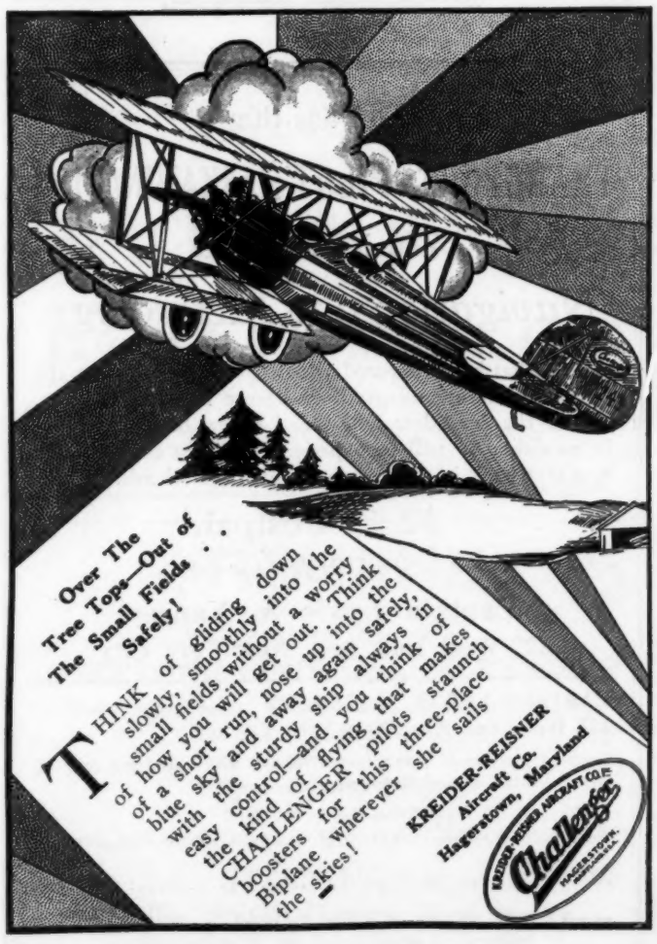
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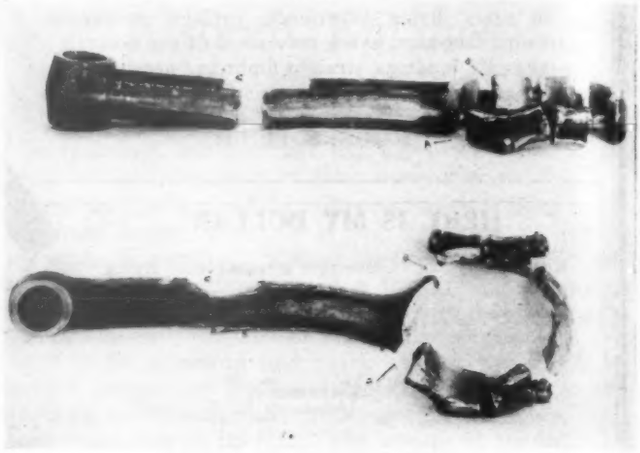
gives a very creditable performance and there are those who have invested money in companies producing a new engine who cannot understand why their first product is not up to the standard set by this engine. They do not realize that this engine has been in the course of development ever since the War.

That is not an exceptional case. Every engine we now have has a history of failures behind it. I can well imagine that some capitalists cannot understand why engineers cannot bat close to 1,000 per cent. Engineers are dealing with inanimate material. Material that can be placed in a testing machine to determine its ultimate strength; material that can be sent to the laboratory and completely analyzed. The capitalist is dealing with people,



A connecting rod that successfully passed the 50 hr. test given the engine in which it was installed, but failed in the next five hours.

separately or grouped in companies and corporations. They cannot be strength tested or analyzed. The capitalist must estimate their strength as well as foresee the stresses they will have to meet. But the capitalist that seldom makes mistakes in his investments is playing, in the parlance of the green table, "close to his chest." If he considers the risk worth $100,000 he may put in $75,000. If our aeronautical engineers were to stress 75,000 lbs., parts that they felt sure could stand 100,000 lbs., Lindbergh would not have crossed the ocean and the airplane industry would still be an infant nursed by the government.

The aeronautical engine designer must take chances, failures in new designs must be expected, and testing equipment must be provided that these failures may occur and the causes thereof be eliminated before the engine is placed on the market. If not for financial reasons then for moral reasons, no company is justified in placing an engine on the market until it is reasonably certain it will not fail in the air.

Conformance with the present Department of Commerce specifications is not sufficient to make reasonably sure. The Department now calls for only 25 hr. running before submission to them for acceptance tests. The engine can be placed on the market if it then lasts through the 50 hr. acceptance tests. The marketing of an engine on the basis of these tests indicates one of two things—(1) a presupposition on the part of the manufacturer that this short test is proof of the durability of the engine; (2) an almost criminal indifference on the part of the manufacturer to the possibility of loss of life by engine failure in the air.

The presupposition is in error. There are innumerable proofs of this. I have in mind one recent case in which we tested a new part for 50 hr. at full power—not throttled. The part withstood this test with a per-

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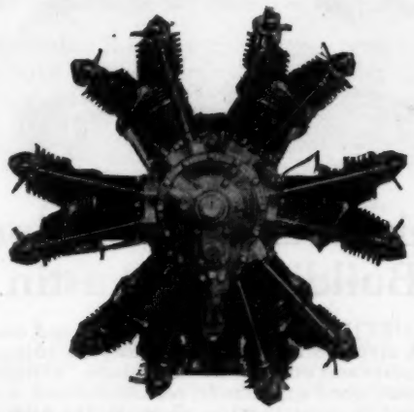

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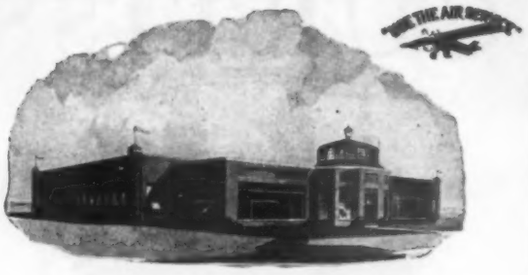

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fect score. We were still not willing to place it in the air so we started a second 50 hr. test. The part failed completely in the first five hours of the second test.

If the manufacture is not to be adjudged guilty of indifference, then, he must test and re-test—not 50 hr., not 100 hr. Five hundred is not too much to ask and there should be no major failures in the 500 hr. If the engine is not expected to run 500 hr. without overhaul, then overhaul it as it would be in service at the specified periods and put it back on the stand. That is legitimate but to limit the test to the service expected up to the first overhaul is neither financially sound nor morally defensible.

Akron Municipal Airport

(*Continued from page* 1927)

provided by the government. Reports are received twice daily from Cleveland and Columbus. The Goodyear-Zeppelin Corp. also has been maintaining a recording weather station at the field for the collecting of data on air conditions over long periods.

Present airplane runways will be used for about a year longer. By that time all grading of the field and several new hangars for airplanes are expected to be completed, so that the permanent flying area at the north end of the field can be put into use. A re-location of lights will be made. At the present time, efforts are being spent in grading, laying of sewers for drainage, and similar preliminary work.

For the benefit of visiting fliers, lights and markers have been erected at prominent points in and near Akron. There is a revolving beacon on the Thomastown school building near the field, and another on top of the Second National building in the downtown section. The Goodyear Tire & Rubber Co. maintains an illuminated direction arrow. Other arrows are situated on the roof of the building of M. O'Neil Co., the factory of B. F. Goodrich Co., the Firestone Tire & Rubber Co. plant, U. S. Post Office, General Tire & Rubber Co. factory, Shell Gasoline Co. plant, and in the town of Ellet, near Akron.

Difficulties Experienced

Akron has experienced considerable difficulty in the past in the establishing of its airport, the delay being caused largely by failure of voters to approve the necessary bond issues. But in recent months the city has taken a keen interest in air matters, largely as the result of awarding the Navy dirigible contracts to a local firm. Those who are promoting aviation activities—the chamber of commerce, city officials, and private interests—predict that a period of progress unsurpassed for its rapidity is now under way, and that the activities will be reflected throughout the community by such things as increased real estate activities, the coming of new industries, and similar indications of progress. The selection and development of Fulton Field as the city's airport was carried out in a deliberate and successful effort to keep the Zeppelin industry at home, for Goodyear Zeppelin officials had stated that they would locate their plant in the city offering the best facilities. That accomplished, the immediate future will be a period of intense construction, in accordance with previously formed plans. So far, no official name for the airport has been selected. Temporarily, it is known as Fulton Field, Akron Municipal Airport.

In addition to Fulton Field, there is one other flying field serving Akron. This is situated at Stow, a short

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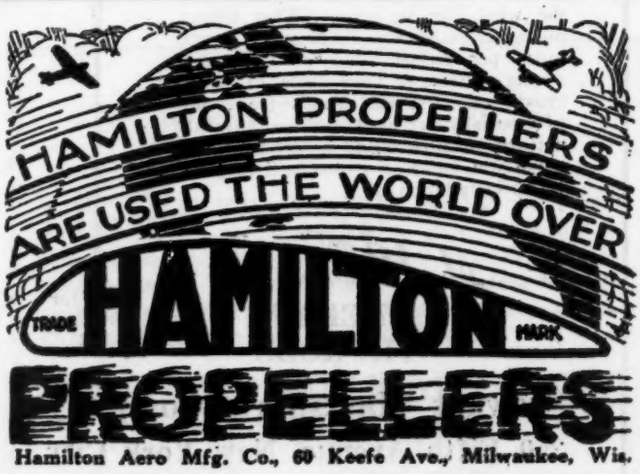

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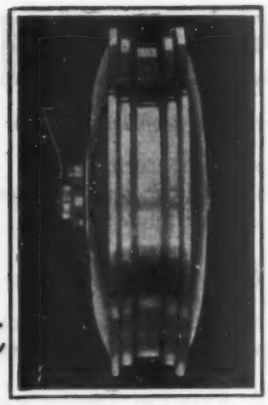

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distance from the northern city limits, and was known as Stow Field for many years. The name has been changed to Akron Airport, Inc., although the field has no connection with the Akron Municipal Airport project. Some confusion has been caused by the similarity of names, hence the retention for the present of the name of Fulton Field.

American Albatross B-1

(*Continued from page* 1925)

The landing gear is of the divided type with wide tread and 32 x 6 in. wheels. Aerol shock absorbers extend vertically to a fitting on the main forward wing strut. From this fitting tubes extend up to the upper longeron wing fitting and back to the lower longeron in order to handle the landing stresses. Bendix wheels and brakes are used with Arens controls from the rudder pedals to the brakes. The tail skid is of the swivel type, laminated steel tube construction, and employs a column of rubber disks in compression as a shock absorber unit.

Before continuing with the production of the B-1 model, the Albatross Aircraft Corp. plans the construction of a four passenger, single engine, cabin monoplane and of a two passenger, open, sport monoplane. The chief features to be incorporated in the smaller planes have been tested with the experimental plane.

The new four passenger craft, which soon will be under construction, according to present plans, will be quite similar to the B-1 model and will have a normal high speed of 130 m.p.h. when equipped with the Curtiss "Challenger" engine. Controls will be dual with pilots side by side and ample room for two additional persons and their luggage.

The sport monoplane promises to be very fast. The features of this plane will be the use of a divided axle landing gear, and mounting the wing on the center of the fuselage, approximately on the line of thrust, where it will be braced top and bottom by streamline steel wires.

There is ample room at the Long Beach Municipal Airport for the expansion planned by the Albatross Aircraft Corp., which it is said will be carried on as orders for new planes make it necessary. The Albatross organization is a closed corporation financed by the four directors: Charles Rocheville, Charles Maxwell, Leslie Penhall, and Jerry Austin.

The specifications of the American Albatross B-1, furnished AVIATION by the manufacturer, are as follows:

Length	39 ft.
Height	11 ft.
Span	56 ft.
Chord	109 in.
Total wing area	482 sq. ft.
Airfoil	Own modification of Gottingen
Weight empty	2362 lb.
Pay load	2000 lb.
Gross weight loaded	4720 lb.
Wing loading	9.79 lb. per sq. ft.
Power loading	18.15 lb. per hp.
High speed	128 m.p.h. at 1700 r.p.m.
Cruising speed	92 m.p.h. at 1350 r.p.m.
Landing speed	40 m.p.h. with full load
Take-off run	250 ft.
Landing run	250 ft. without brakes
Service ceiling	19,000 ft.
Range at cruising speed	500 mi.
Endurance at cruising speed	6 hr.
Gasoline capacity	116 gal.

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SIDE SLIPS

By ROBERT R. OSBORN

We read that there is a model airport on exhibition at the Chicago show "complete in every detail including landing field, buildings, runways, and lights." A good way we can think of to test the completeness of detail in this model is to see if a disappearing gas truck and several self-hiding tail skid dollies are also included.

* * *

"The eyes of all Paris were fixed this afternoon for more than twenty minutes on an airplane that seemed riveted to the clouds at a height of about 1,000 feet over the center of the city. It was an auto-gyroscope of the type developed by Juan de la Cierva."

Sent in by C.B.A., which initials can be recognized as those of a prominent New York writer on aviation subjects, with the comment, "I guess Professor Cierva has given up his auto-giro."

* * *

Mr. J. W. M. of Brazil, Ind., suggests that the N. A. A. might establish official supervision of altitude records for airports, starting with an investigation of the claims of Big Bear City Airport in California, which, according to the news item is "uniquely situated between Big Bear and Baldwin lakes *7,000 Miles* above sea level."

* * *

"ESTIMATE 25,000 KILLED BY MOTORS."
"TO MAKE FLYING SAFE AS MOTORING."

Side-by-side headlines in the Boston Herald found by S. O. of Cambridge, Mass.

Apparently the intention is to make the airplane an even more effective war machine than it is now.

* * *

E. G. H. of Schenectady, N. Y., airport writes in to warn all pilots of Sikorsky "amphibions" visiting that airport to land with wheels retracted and anchor dragging, after reading the news item "In tests conducted at Roosevelt Field, N. Y., a Sikorsky plane landed time and again in a space only 200 by *12,000 feet.*"

* * *

What we think to be a very good story about the misplaced enthusiasm of one of our airplane manufacturers when he was making his first attempt at selling an airplane, came to hand, and is told in the following, all names being omitted of course. The subject of the story had made a fortune in another business and had been convinced to enter airplane manufacturing by a friend, an aeronautical engineer. The first plane to be worked up was a proposal to the Navy and the engineer was asked to prepare characteristics and performance of the proposed plane so that the manufacturer could attempt to sell it at Washington. This was done and he went off with drawings and sketches to make the sale. In the middle of his enthusiastic sales discourse, in which he followed the notes prepared by the designer, he exclaimed: "And look at this,—dihedral, one degree; that's going to be the best dihedral ever built in an airplane!"

* * *

Each day we seem to have more and more aspirants for honors in making trans-Atlantic flights and increasing numbers of cities offering large prizes for flights ending at their fields. One possible explanation of the popularity of these flights is that one can land almost anywhere on this side or the other and be sure of picking up ten thousand dollars or so in prizes.

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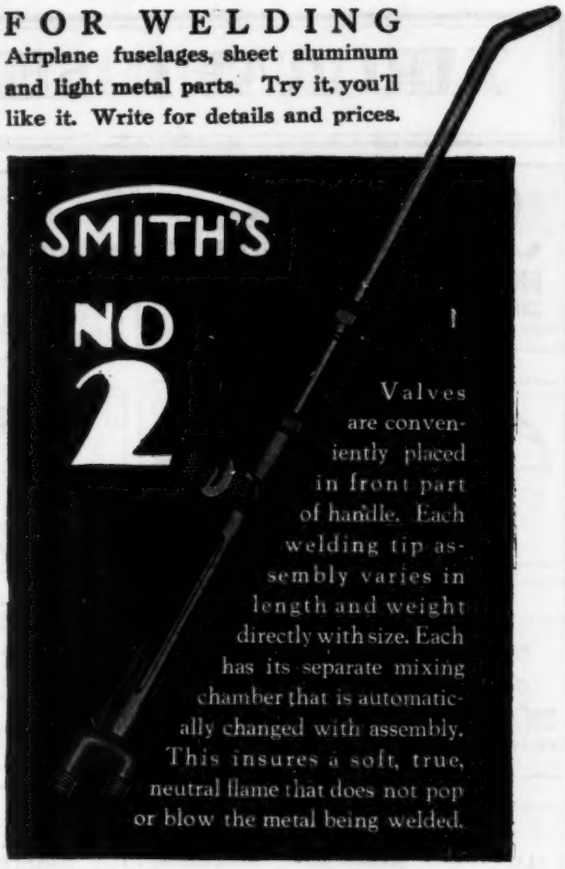
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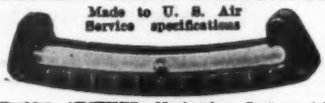
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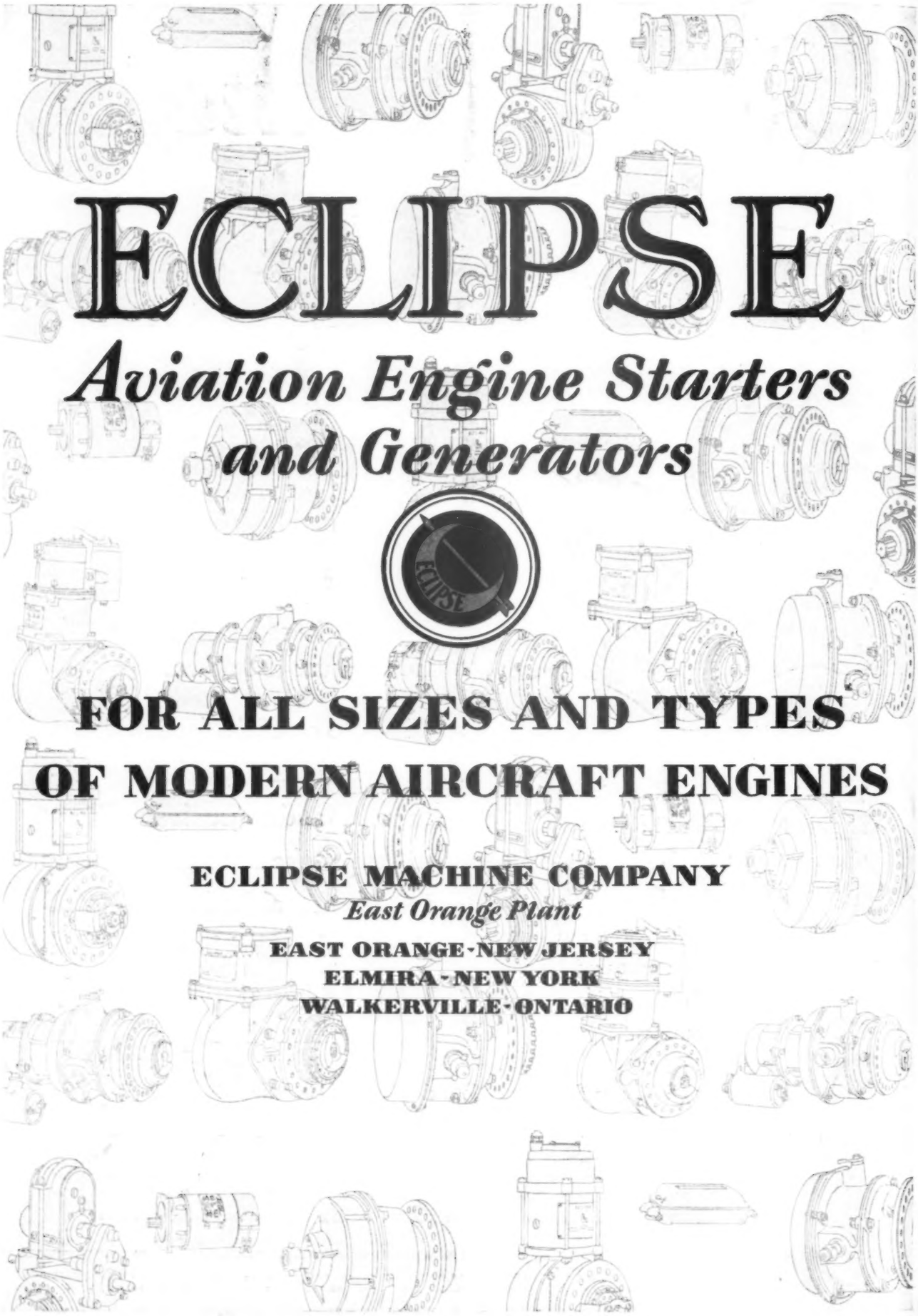

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